Data Summary Report for On-Site Soils Omega Chemical Superfund Site Whittier, California

April 26, 2001

Submitted to:

U.S. Environmental Protection Agency
Region IX

Prepared for:

Omega Chemical Site PRP Organized Group

Prepared by:

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CDM Project No. 10500-30697-TO3.REPORT

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April 27, 2001

Ms. Nancy Riveland-Har
Superfund Division (SFD 7-4)
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, California 94105-3901

Subject: Submittal of Data Summary Report
Omega Chemical Superfund Site
CDM Project No. 10500-30697-TO3A.REPORT
CDM File No. 10500-5.2.3

Dear Ms. Riveland-Har:

On behalf of the Omega Chemical Site PRP Organized Group (OPOG), Camp Dresser & McKee Inc. (CDM) is herein submitting two copies of the Data Summary Report for On-Site Soils for your review. Please feel free to contact me or Chuck McLaughlin (909/222-0387) if you have any questions.

Sincerely,

CAMP DRESSER & MCKEE INC.

Sharon L. Wallin

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Enclosure

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Section 1
Introduction

On behalf of the Omega Chemical Site PRP Organized Group (OPOG), Camp, Dresser & McKee Inc. (CDM) has prepared this Data Summary Report for the Omega Chemical Superfund Site (Site). The Site is located at 12504 East Whittier Boulevard in Whittier, California (see Figures 1-1 and 1-2 for Site location and vicinity maps). This report was prepared in accordance with Task 3 of the Scope of Work for Pre-Consent Decree Tasks (OPOG, August 31, 1999), agreed upon by OPOG and USEPA prior to execution of the current Consent Decree (CD) between OPOG and the United States Environmental Protection Agency (USEPA). The current CD was entered into Federal Court on February 28, 2001.

1.1 Purpose and Objective

The objective of this document is to provide a history of activity at the Site and identify any potential data gaps with Site assessment data collected to date. The work is being done to support the design and implementation of a groundwater containment and mass removal treatment system in the Phase 1a area, and implementation of a vadose zone Remedial Investigation/Feasibility Study (RI/FS) for contaminant releases to subsurface soils at the Site. The Phase 1a area is defined in the Consent Decree as the area of soil and groundwater contamination attributable to the Omega property and extending downgradient approximately 100 feet southwest of Putnam Street. Identification of any data gaps and specific recommendations for additional data collection are provided in Section 5 of this document.

The following documents were reviewed for the preparation of this report:

<u>Omega Chemical Site</u>

- Technical Memorandum: Preliminary Health-Based Clean-up Goals for the Omega Chemical Superfund Site (CDM, pending)
- Aerial Photographic Analysis, Omega Chemical Site (prepared by Lockheed Environmental Systems & Technologies Co. for USEPA, April 2000)
- Phase 1a Pre-Design Field Investigation Report, Omega Chemical Superfund Site (CDM, October 13, 1999)
- Streamlined Risk Evaluation Planning Document, Omega Chemical Superfund Site (CDM, October 8, 1999)
- Technical Memorandum No. 11A, Results of Offsite CPT/Groundwater Investigation, Omega Chemical Site (C_2 Rem, April 30, 1997)
- Technical Memorandum No. 11, Final Offsite CPT/Hydropunch Investigation, Omega Chemical Site (C_2 Rem, February 10, 1997)

- Phase II Close Out Report, Omega Chemical Site (England & Associates and Hargis + Associates, Inc., October 1, 1996) (Note: Technical Memoranda Nos. 1 through 9, which detail work performed by OPOG, are included in Appendix A of the Close Out Report).
- Operation Plan for Hazardous Waste Recovery Facility (Omega Chemical Corporation, Amendments January 10 and October 29, 1990).
- Report on Site Assessment Investigations at Omega Recovery Facility (ENSR, October 14, 1988).
- Report on Soil Vapor Survey of Fred R. Rippy Trust Real Estate Property (ERT, February 2, 1988).
- Results of Laboratory Analysis Performed on Soil Samples Collected after the Removal of an Underground Tank Located on the Fred Rippy Trust Property (Leighton and Associates, Inc., August 26, 1987).
- Investigation of Subsurface Soil Contamination at Tank Farm, Omega Chemical Corporation (LeRoy Crandall and Associates, June 26, 1985).

Adjacent/Nearby Properties

- Report of Geotechnical Investigation; Proposed Hospital Additions, Presbyterian Intercommunity Hospital (Law/Crandall, December 30, 1999).
- Phase I Environmental Assessment for Property Located at 12484 Whittier Boulevard (Cal-Air Conditioning Company) (Centec Engineering, August 5, 1997).
- Phase I Environmental Site Assessment of the Property Located at 12511 Putnam Street (Terra-Pave) (Cardinal Environmental Consultants Inc., September 11, 1991).

The Phase II Close Out Report is a predecessor to this Data Summary Report. The Close Out Report summarized available Site information for the period from 1985 through mid-1996, as well as background information (ownership and operational history, geology, hydrogeology, etc.), and has been heavily referenced in this document. As noted above, Appendix A of the Phase II Close Out Report contains nine Technical Memoranda (TM) which detail work performed by OPOG. The nine TMs are discussed in Section 3.2 of this document.

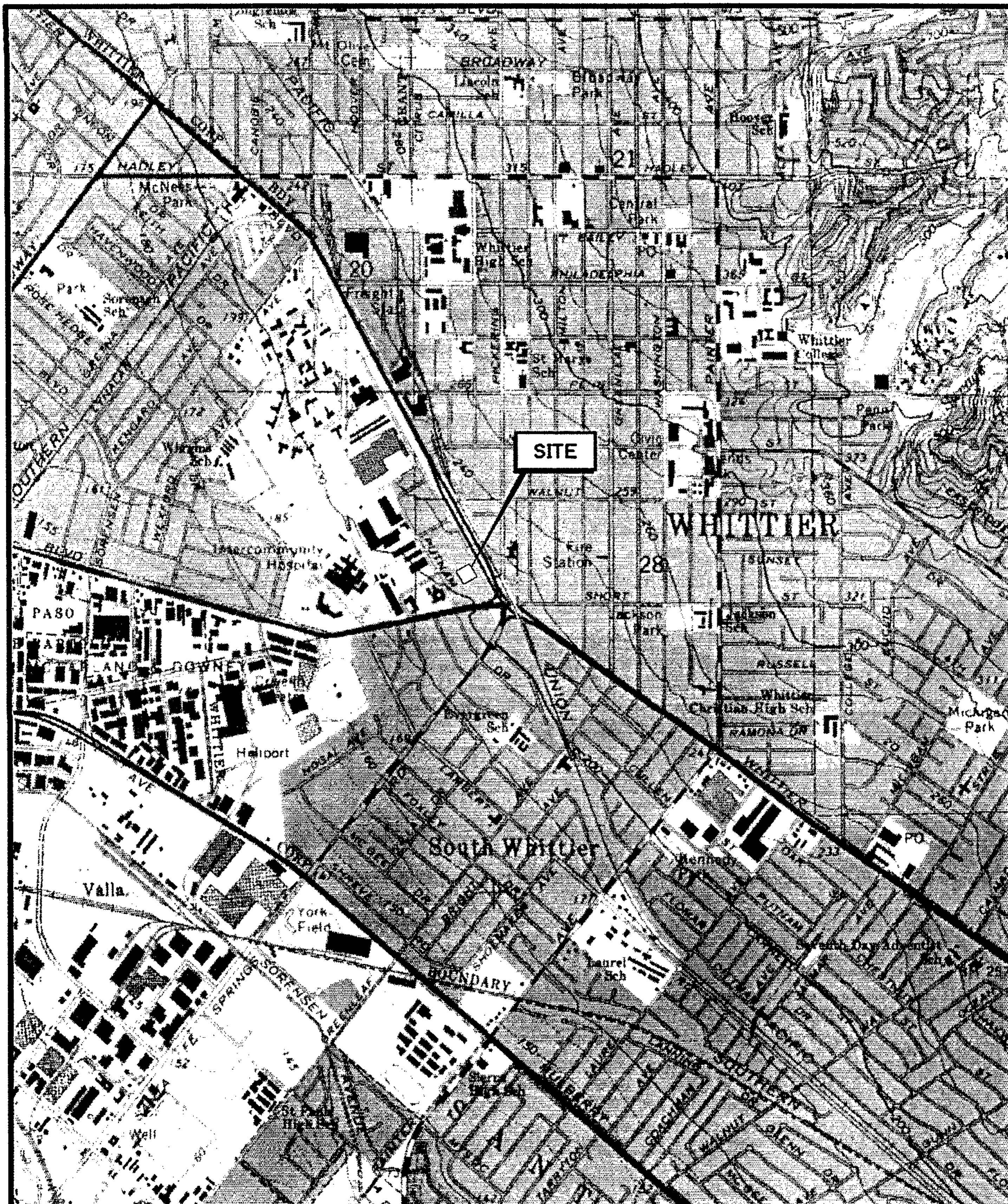
1.2 Organization of Report

This report is organized into six sections, as follows:

- Section 1 - Introduction
- Section 2 - Historical Background

- Section 3 - Site Conditions
- Section 4 – Regulatory Background and Site Assessment
- Section 5 – Evaluation of Data Gaps
- Section 6 – References
- Appendix A – Historical Figures, Tables and Executive Summary
- Appendix B – Lithologic Logs and Well Completion Drawings
- Appendix C – List of Violations and Enforcements
- Appendix D – Omega Operation Plan

Figures and tables developed for this summary report are provided at the rear of each section where they are first discussed.

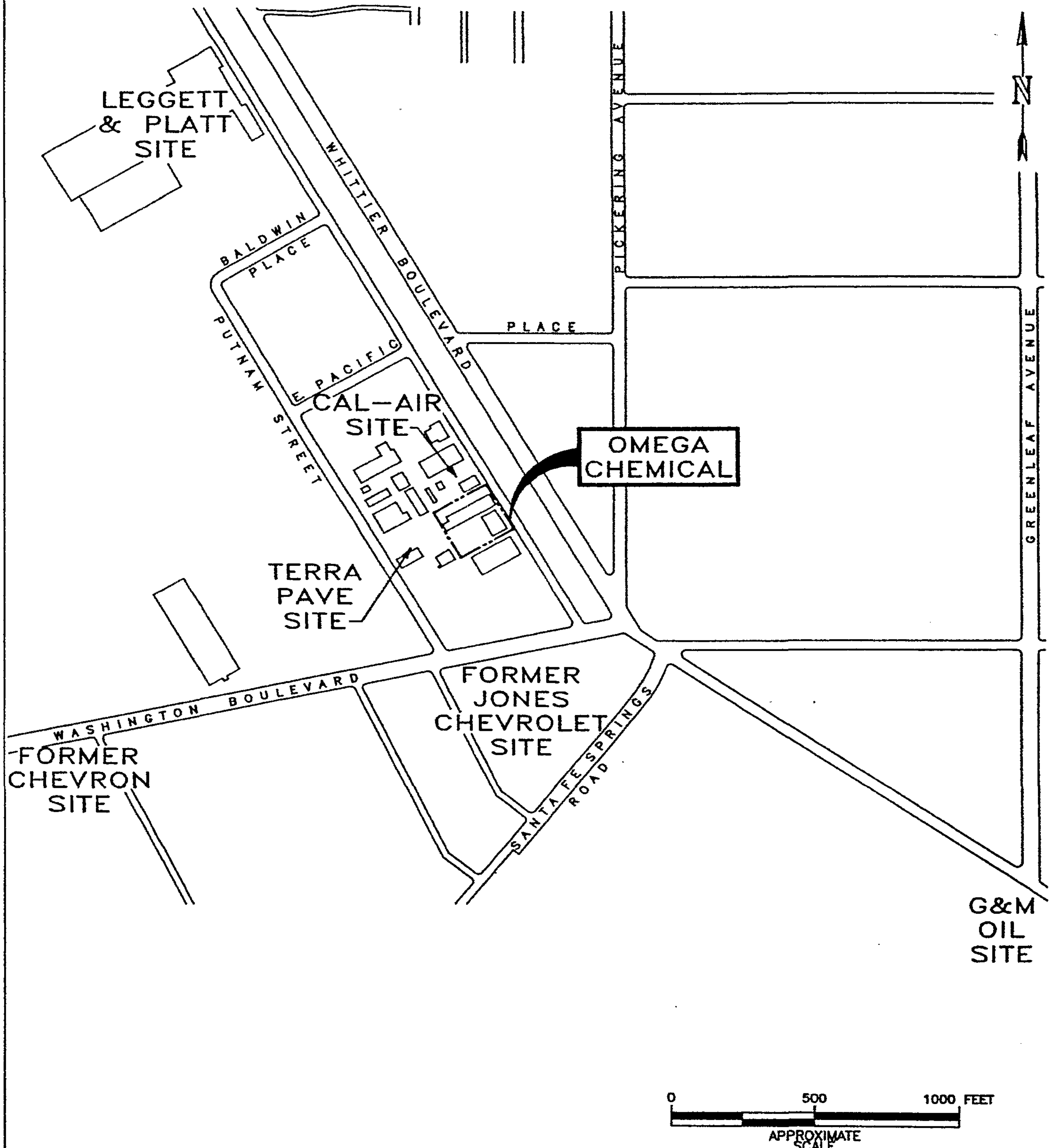


OMEGA CHEMICAL

SITE LOCATION MAP

CDM
environmental engineers, scientists, planners, & management consultants

Figure 1-1



SOURCE: England & Associates and Hargis + Associates, Inc.

OMEGA CHEMICAL

VICINITY MAP

CDM
environmental engineers, scientists, planners, & management consultants

Figure 1-2

FIG_1-1 12/15/98 09:48:52 2:28:08

Section 2
Background Information

The following section is a summary of information regarding previous owners, operations, and known historical chemical use at and in the vicinity of the Site. A series of historical aerial photographs were reviewed to evaluate potential chemical storage and possible release areas at the Site.

2.1 History of Site

2.1.1 Owners and Operations

The subject Site located at 12504 East Whittier Boulevard was developed in 1951. The subject Site occupies Los Angeles County Assessor Tract No. 13486, Lots 3 and 4. The Site is approximately 41,000 square feet in area (200 feet wide x 205 feet long) and contains two structures – an approximate 140 by 50 foot warehouse and approximate 80 by 30 foot administrative building. A loading dock is also attached to the rear of the warehouse. The exterior areas are concrete-paved and the Site is secured with a perimeter fence and locking gate.

Prior to construction of the Site buildings in July 1951, the Site was used for agriculture. The Site was operated by Sierra Bullets prior to 1963. During operation of the Sierra Bullet facility, a 500-gallon underground storage tank was utilized for storage of kerosene.

The Omega facility provided treatment of commercial and industrial solid and liquid wastes and a transfer station for storage and consolidation of wastes for shipment to other treatment and or disposal facilities. According to the October 29, 1990 Operation Plan for Hazardous Waste Recovery Facility, the Omega Facility maintained eleven treatment units comprised of distillation columns, reactors, wipe film processor, liquid extractor, and a solid waste grinder. The facility also maintained 22-stainless steel tanks with capacities ranging from 500 to 10,000 gallons, and 5 carbon steel tanks with capacities of 5,000 gallons.

Two inactive sumps are located in the warehouse loading dock area. One sump is rectangular (19 feet long x 5.5 feet wide x 5 feet deep) and the second sump is square (6 feet long x 6 feet wide x 6 feet deep). The roof in the loading dock area is in poor repair, allowing rainwater to collect in both sumps. A composite aqueous sample was collected from the sumps on July 11, 2000 and submitted for analysis of VOCs (including Freon 113 and acetone) by EPA Method 8260, TPH by Method 8015M, TRPH by EPA Method 418.1, and CAM metals. TPH and TRPH were not detected in the sample. Only one VOC was detected at a low concentration (PCE at 2.6 µg/l), all other VOCs were not detected.

On August 23, 2000, the accumulated rainwater (945 gallons) was removed from the sumps using a vacuum truck. The sumps were pressure washed and fluids were transported under Non-Hazardous Waste Manifest to the Demenno/Kerdoon facility in Compton, California for recycling. In order to prevent the future accumulation of rainwater in the sumps, both sumps were backfilled with a sand slurry concrete mix.

The warehouse is leased by a tenant (Mr. Nicholas Stymuiank) who currently occupies the warehouse and stores miscellaneous equipment and materials in the warehouse and service yards.

A summary of property owners/operators is provided below:

- Late 1930s – property was undeveloped or used for agricultural purposes.
- 1951 – property developed, construction of office and warehouse for Sierra Bullets.
- 1963 through 1996 - property purchased and occupied by Fred R. Rippy, Inc.
- 1966 through 1971– property used to convert vans to ambulances.
- 1971 through 1976 – property occupied by Bachelor Chemical.
- 1976 – Omega Chemical (Mr. Dennis O'Meara) purchases Bachelor Chemical Processing (northwestern half) and assumes the property lease from Rippy.
- 1987 – Omega Chemical purchases the leased parcel and adjoining southeastern section from Rippy.
- April 11, 1991 – Omega ordered by the Superior Court of the County of Los Angeles to cease operation, remove all hazardous wastes, and close the facility.
- September 1991 – Omega files Chapter 11 bankruptcy, which was dismissed on September 7, 1993.

2.1.2 Review of Historical Aerial Photographs

In April 2000, Lockheed Environmental Systems & Technologies Co. of Las Vegas, Nevada completed an Aerial Photographic Analysis of the Site under contract with the USEPA (USEPA, 2000). A total of 13 dates of aerial photographs for the years from 1928 to 1994 were reviewed. The objective of the analysis was to document features and activities of environmental significance including surface morphology, property use, and evidence of hazardous waste disposal at the Site in support to the Site investigation. The Site as described within the analysis included approximately 52 acres extending from Washington Boulevard north-northwest to Baldwin Street and bounded by Putnam Drive to the west and Whittier Boulevard to the east. The actual property occupied by Omega Chemical Corporation is approximately 0.95 acres. The following is a summary of observations of both the Site and adjacent properties during the review.

Site Observations

The Site was used for agricultural purposes as an orchard between 1928 and 1946. The 1956 photograph shows the Site developed with the warehouse and office building. Spillage or other surface discoloration was noted in the unpaved yard west of the office building (hereinafter referred to as the "western yard"). The yard north of the warehouse (hereinafter referred to as the "northern yard") appears to have been paved and was used for parking. In the 1959 photograph, spillage and/or surface staining was again noted in the unpaved yard south of the warehouse (hereinafter referred to as the "southern yard"). An area of mounded earthen material was also observed within the southern yard. The spillage and staining observed in 1956 and 1959 was not noted in the 1963 photograph. The 1966 photograph shows some surface staining, a small access road leading offsite and mottled-toned surface coloration typical of vegetation stress. The 1970 photograph shows at least half of the southern yard to be paved, with possible disturbed ground in the rear portion of the Site. In 1972, paving was observed throughout the Site. In addition, a number of vehicles and/or containers were observed in both the northern and southern yards.

The 1978 photograph shows the initial evidence of chemical use on the Site. Five vertical tanks were observed in the northwestern corner of the property, and stacked drums and small areas of spillage were noted in the northern yard. Two notable areas of staining and/or spillage were observed emanating from both the northwestern and southwestern side of the office building toward the center of the southern yard. The soil within the western portion of the yard appears to be exposed with locations of mounded material (possible excavation).

In 1984, a total of nine vertical and two horizontal tanks were observed in the northwestern portion of the Site. The northern yard appears to be full of drums and small storage containers. A large stain and/or spillage was observed in the southern yard, however, unlike the 1978 photograph, the discharge point is located closer to the center of the western side of the office building. A bulldozer and various toned materials suggesting earthmoving activities were observed in the southwestern portion of the Site. The earthmoving activities may have been in preparation for the installation of six vertical tanks observed in this area in the 1989 photograph. The resolution of this photograph was poor; however, up to 12 additional vertical tanks were observed in the northwest corner and stacked rectangular objects were observed in the central portion of the southern yard.

In 1993, seven of the vertical tanks and the two horizontal tanks observed in the northwest corner of the Site were no longer present. Instead, five vertical tanks (two different sizes) were located in the northern yard along with stacked crates. The six vertical tanks located within the southwest portion of the Site were still present in both the 1993 and 1994 photographs. In 1994, two additional vertical tanks were observed in the northwest portion of the Site. The yards still contain stacked crates. The 1994 photo was the final year included in the aerial photographic analysis.

2.1.3 Facility Processes and Chemical Usage

Limited information regarding volumes and types of wastes handled by the Omega Chemical Corporation was available for review. According to the Phase II Close Out Report, Omega Chemical Corporation operated the facility for recycling and treatment of spent solvent and refrigerant. Drums and bulk loads of waste solvents and chemicals (primarily chlorinated hydrocarbons and chlorofluorocarbons) from various industrial activities were processed to form commercial products which were returned to generators or sold in the marketplace. An Operation Plan prepared by Omega Chemical Corporation in 1990 for proposed expansion of the facility, provided a summary of current and proposed facility processes, tank capacities, incoming and facility-generated waste stream characteristics and handling practices, etc. The Operation Plan has been included in Appendix D of this report.

Part II of the Operation Plan provided the following summary of treatment facilities present in 1990:

- Treatment Unit T- 1 (Fat Jack) - 36 feet wiped film processor
- Treatment Unit T-2 (Kirk) – 20 foot x 1 foot diameter distillation column
- Treatment Unit T-3 (Paul) – 350 gallon pressure vessel with 30 foot x 8 inch diameter distillation column
- Treatment Unit T-4 (Craig) – 550 gallon pressure vessel with 20 foot x 8 inch diameter distillation column
- Treatment Unit T-5 (Neal) – 50 gallon glass lined reactor
- Treatment Unit T-6 (Jake) – 13.5 feet wiped film processor
- Treatment Unit T-7 (Mork) – 1,000 gallon pressure vessel with 20 foot x 1 foot diameter distillation column
- Treatment Unit T-9 (Liquid Extraction) – unit performs liquid-liquid extraction
- Treatment Unit T-10 (Patrick) – 36 feet wiped film processor
- Treatment Unit T-13 (Pete) – 2,500 gallon pressure vessel with 20 foot x 1 foot diameter distillation column
- Treatment Unit T- 16 (Solids Grinding Unit) – unit grinds solid waste to a pumpable liquid form.

The majority of these treatment units were located in the general area of the warehouse loading dock. Figure II-7 of the Operation Plan (see Appendix D) illustrates the locations of these treatment units.

Part II of the Operation Plan listed the following storage facilities:

- Storage Tanks A through F – 6 stainless steel tanks with 10,000 gallon storage capacity per tank.
- Miscellaneous Named Tanks – 16 stainless steel tanks (Heidi, Jenny, Elaine, Amy, etc.) with the following storage capacities: 1 x 5,000 gallon, 1 x 3,500 gallon, 4 x 2,000 gallon, 1 x 1,300 gallon, 1 x 1,200 gallon, 3 x 750 gallon, 1 x 650 gallon, and 4 x 500 gallon.
- Storage Tanks 1 through 5 – 5 carbon steel tanks with 5,000 gallon capacity per tank.

As indicated above, a total of 27 storage tanks with a combined storage capacity of 109,400 gallons were present at the facility in 1990. As shown on Figure II-10 (Appendix D), storage tanks A through F were arranged in an L-shaped pattern in the southern corner of the Site. Storage tanks 1 through 5 were located in the western yard, and were arranged in a linear pattern along the side of the warehouse. The locations of the smaller storage tanks were not indicated in the Operation Plan.

Wastes accepted by Omega Chemical Corporation for recycling were broadly characterized as organic solvents and chemicals, and aqueous wastes with organic waste constituents. Sources of the incoming waste were generated by a wide assortment of manufacturing and industrial processes (petroleum refining, rubber and plastics, chemicals, paper and allied products, furniture and fixture products, lumber and wood products, printing and publishing, textile mill products, food and kindred products, etc.). Most of the wastes reportedly arrived at the Site manifested under a few common EPA waste codes (e.g., D001 ignitable waste, and F001 through F005 halogenated and non-halogenated waste).

Typical types and volumes of wastes generated by Omega Chemical Corporation were discussed in Section V of the Operation Plan and listed in Tables V-1 and V-2, respectively. According to Table V-1, typical Omega-generated waste consisted of the following: C6 to C11 aliphatics (43.4%), xylene (16%), toluene (7.2%), C9 to C10 alkyl benzenes (5.2%), isopropyl alcohol (5.1%), and a variety of other compounds. According to Table V-2, hazardous wastes manifested off-Site from the Omega facility during 1989 consisted of the following: 19,300 gallons of aqueous solutions with total organic residues less than 10% (DHS Code 134); 1,600 gallons of halogenated solvents (DHS Code 211); 47,245 gallons of still bottoms with halogenated organics (DHS Code 251); 665,000 gallons of other bottom wastes (DHS Code 252); and 120 tons of other organic solids (DHS Code 352).

According to the Operation Plan, the 5,000 and 10,000 gallon storage tanks listed above were used to store solvent wastes prior to distillation. Distillation units T-2, T-3 and T-4 had a total treatment capacity of 1,500 gallons per hour. The wiped film evaporation units had a design treatment capacity of 200 gallons per hour.

2.2 Adjacent and Nearby Properties

One commercial property (Skateland) and two industrial properties (Cal-Air and Terra Pave) are located immediately adjacent to the Site (southeastern, northwestern, and southwestern boundaries, respectively). The northeastern boundary of the Site is bordered by Whittier Boulevard and a frontage road. The three commercial/ industrial properties immediately adjacent to the Site and nearby properties are discussed in the following sections.

2.2.1 Skateland

Skateland is located on Whittier Boulevard, adjacent to the southeastern boundary of the Site. The property consists of an indoor roller-skating rink that is currently in operation and open to the general public. Review of the aerial photographs indicates that the property was used for agricultural purposes in 1946. The building which presently occupies the property was observed on the 1956 photo. There were no documents or reports available for review for the Skateland property.

2.2.2 Terra Pave

The Terra Pave, Inc. facility is located at 12511 East Putnam Street, adjacent to the southwestern boundary of the Site. For information regarding historical activities at the Terra Pave property, a Phase 1 Environmental Site Assessment (ESA) Report prepared by Cardinal Environmental Consultants (Cardinal) on September 11, 1991, was reviewed.

The Phase I ESA Report was prepared for the New England Lead Burning Company (NELCO), which operated the Site beginning in the mid-1950's. During the September 1991 Site visit, the property was unoccupied. According to the report, NELCO purchased lead in sheet, pipe and solid rods and fabricated the desired product by burning (welding) the lead to the required shape. The welding was performed in the building located along the northeastern portion of the property (Building 2). The type of work performed in the remaining building (Building 1) was primarily carpentry work and did not involve lead welding. Building 1 was also used for offices and warehousing. The exterior of the property was used for storage of equipment and loading materials or finished goods for shipment. The report noted that the undeveloped portions of the property consisted of exposed soil and miscellaneous rubble. Drainage patterns incised in the soil were observed trending in a southerly direction towards Putnam Street.

The report briefly discussed the findings of environmental investigations performed between 1989 and 1991 to evaluate the property for the presence of residual lead. To mitigate this concern, NELCO subcontracted Vector Three Environmental Inc. of Brea, California, to clean the interior of all facilities and remove superficial lead from the topsoil. Remedial activities were monitored by Cardinal staff and confirmatory dust wipe and soil samples confirmed that remaining lead levels were extremely low. The environmental reports and sampling results were not available for review, therefore, lead levels prior to and after remediation and the depth of the soils removal are unknown.

2.2.3 Cal-Air

The Cal-Air facility is located at 12484 Whittier Boulevard, adjacent to the northwestern boundary of the Site. For information regarding the Cal-Air property, a Phase I Environmental Assessment for the Evaluation of Potentially Hazardous Materials (Centec Engineering, Inc., August 5, 1997) was reviewed. The report was prepared for Maple Brothers Industrial, Inc. According to the report, a machine shop and office were constructed at the property in 1954, apparently by Roger Maples. The property was occupied by Accessory Products, Inc. until approximately early 1976. In September 1976, Cal-Air Conditioning Company added three new offices and occupied the property until 1996. The building on the property consists of a conglomeration of structural types, representing many additions and expansions during the years the property was occupied. A below-grade room and "test tunnel" is reportedly located along the southern side of the building. According to a City Building Department document, the test tunnel was to be used for non-hazardous test work on government projects. At the time of the assessment, the property was unoccupied and access to the test tunnel access was blocked by a heavy metal door and a large amount of water in the vault of the front entrance.

In October 1987, four underground storage tanks (USTs) used to contain gasoline and diesel fuels were removed from the property by Toxguard Systems, Inc. Laboratory analytical results indicated 72 parts per million hydrocarbons in one of the soil samples collected from under the USTs, with no detectable concentrations in the remaining seven samples submitted for analysis.

2.2.4 Nearby Properties

The Phase II Close Out Report provided information on four nearby properties located within an approximate one-half mile radius of the Omega Site. Fuel hydrocarbons (aromatic organics, total petroleum hydrocarbons, etc.) were detected in the groundwater underlying a former Chevron Station site located approximately 1,500 feet southwest (downgradient) of the Site. Fuel hydrocarbons were also detected in soil samples collected from a gasoline service station (G&M Oil Co.) located approximately 2,300 feet southeast (cross-gradient) of the Site. Napthalene, trichloroethene (TCE), tetrachloroethene (PCE), and other fuel hydrocarbons have been detected at a Leggett & Platt furniture manufacturing facility approximately 2,000 feet northwest (upgradient) of the Site.

At a former automobile dealership (Jones Chevrolet) located 800 feet south of the Site, a variety of contaminants (fuel hydrocarbons, chlorinated organics, freons, MTBE, aromatic organics, etc.) have been detected in groundwater underlying the property. A tabulated summary of contaminants found at these four properties and a location map (Figure 4) are provided in Appendix A of this document.

In mid-2000 under subcontract to USEPA, Roy F. Weston, Inc. staff initiated an assessment of historical and current properties downgrandient of the Omega Site and upgradient of water supply well 30R3. This work was authorized by USEPA in order to identify potential sources of contamination downgradient of the Omega Site. Due to the industrial and commercial nature of the study area, it is likely that the assessment will identify additional potential contributors to observed groundwater contamination downgradient of the Omega Site. The findings of the assessment are currently pending.

2.3 Compounds of Potential Concern

A Streamlined Risk Evaluation (SRE) Planning Document was prepared concurrent with implementation of the Phase 1a field investigation (CDM, October 8, 1999). The SRE Planning Document included a preliminary identification of chemicals of potential concern (COPC). Historical and recent sampling results were used to develop the COPCs for soil, soil gas, and groundwater, which are summarized in SRE Tables 2-1, 2-2, and 2-3, respectively. As indicated on the tables, COPCs consist primarily of VOCs (e.g., PCE, 1,1,1-trichloroethane [TCA], TCE, and methylene chloride [MC]).

2.4 On-Site Soils Risk Assessment

A risk assessment for on-Site soils was performed by OPOG in order to develop Site-specific human health-based cleanup goals (HBCGs). The purpose of the HBCGs is to guide subsequent investigations at the Omega Site (e.g., upcoming remedial investigation/ feasibility study [RI/FS] for soils). A draft of the risk assessment was presented to USEPA staff in a meeting on January 22, 2001. The draft document (Preliminary Health-Based Clean-up Goals for the Omega Chemical Superfund Site) is currently being revised to incorporate USEPA comments and will be resubmitted as a technical memorandum.

As discussed in the risk assessment, PCE is an appropriate indicator chemical to represent volatile compounds at the Site because it has been widely detected at relatively high concentrations in Site soils. As indicated in the draft document, elevated PCE concentrations greater than 10,000 micrograms per kilogram (ug/kg) were detected in one general area, along the Site boundary adjacent to the Terra Pave facility.

Section 3
Site Conditions

3.1 Location and Climate

The Omega Site is located at 12504 East Whittier Boulevard, Whittier, California. The climate of the area is characterized as semi-arid, with an average annual precipitation of approximately 16 inches. Precipitation occurs mainly during the winter and spring months.

3.2 Surface Topography

The Site is relatively flat and is situated at an approximate elevation of 220 feet above mean sea level. Currently, an office building and warehouse occupy the Site, with concrete paving covering exterior areas. Aerial photographic review (see Section 2.1.2) indicated that exterior areas were primarily unpaved until approximately 1972.

3.3 Regional Geology and Hydrogeology

The Site is located in the Montebello Forebay area of the Central Groundwater Basin of the Coastal Plain of Los Angeles. The Montebello Forebay is an important area of groundwater recharge. Groundwater flow in the area is generally towards the southwest, originating in an area of recharge and flowing toward an area of discharge.

The Site is underlain by low permeability silty and clayey soils of the upper Pleistocene Lakewood Formation. The Lakewood Formation is locally derived from erosion of the Puente Hills to the northeast, and may be overlain by a thin cover of Holocene slopewash and alluvium that can be difficult to distinguish from the Lakewood Formation on the basis of lithology. Furthermore, local merging and interfingering of geologic units near the basin margin makes positive identification of individual geologic units encountered in borings problematic. The uppermost aquifer in the Site vicinity, probably the Gage aquifer in the lower portion of the Lakewood Formation, does not occur directly beneath the Site.

The direction of regional groundwater flow is generally to the southwest. Regional flow direction is illustrated on Appendix A, Figure 17. The nearest active downgradient water supply wells are located more than one mile from the Site. The closest active well (well 30R3) is located on Dice Road by Burke Street, approximately 1.25 miles downgradient of the Site. This well is screened from 200 to 900 feet bgs and at least two aquitards appear to be present between the shallowest aquifer and the top of the well screen. A copy of the driller's log for well 30R3, which includes descriptions of the subsurface materials and well construction details, is included in Appendix B of this document.

3.4 Local Geology and Hydrogeology

This discussion of local geology and hydrogeology is based on an evaluation of lithologic logs from borings and wells advanced at the Site and at properties downgradient of the Site. An understanding of the nature of the subsurface materials underlying and in proximity to the Site is important towards understanding contaminant migration. Therefore, detailed descriptions of subsurface materials noted during prior investigations at the Site and in the vicinity of the Site are provided below. Copies of all available lithologic logs have been compiled in Appendix B.

Subsurface Materials Immediately Underlying the Site

The Site is underlain by low permeability silty and clayey soils of the upper Pleistocene Lakewood Formation, probably representing the Bellflower aquiclude (England & Associates, Hargis + Associates, Inc., October 1, 1996), to a depth of at least 120 feet bgs. Note that the term "aquiclude" is used in the published literature, but "aquitard" is a more accurate description of this stratigraphic unit. No transmissive aquifer was found immediately beneath the facility during field investigations performed by Omega Chemical or OPOG.

During the 1999 investigation, groundwater was measured in on-Site well OW-1 at an approximate depth of 70 feet below ground surface (bgs). The well is screened in low permeability silts and clays. A coarser-grained sandy layer, probably representing the Gage aquifer, was encountered southwest of the facility along and downgradient of Putnam Street, but was not detected beneath the Site. The following discussion includes detailed descriptions of subsurface materials obtained from lithologic logs from on- and off-Site borings.

Numerous soil borings (S-1 through S-5 and S-1A, B-1 through B-3, and BMW-2) were advanced and one well (BMW1) was installed in the western yard and western corner of the Site during investigations conducted in 1985 and 1988. Shallow soils (i.e., soils found at depths less than 10 feet) consisted primarily of fine-grained materials (e.g., clayey silts and silty clays). The deeper borings (B-1 through B-3 and BMW-2) ranged in depth from 20.5 to 60 feet bgs and also consisted primarily of fine-grained materials. Boring BMW-2 was intended for completion as a groundwater monitoring well; however, groundwater was not encountered during drilling and the boring was terminated at a depth of 60 feet bgs.

Lithologic materials at the location of well BMW-1 were predominately fine-grained above a depth of 57 feet bgs. Materials observed in the interval from 57 to 73 feet bgs consisted of a combination of silty clayey sand and silty sandy clay. In the interval from 73 to 110 feet bgs, coarser-grained materials (silty clayey sands) were observed. During drilling and well installation, groundwater was encountered at a depth of 75 feet bgs. The well was completed to a depth of 100 feet bgs with the installation of 90 feet of blank casing and 10 feet of perforated casing. No surface expression of the well remains and no plugging and abandonment record could be found. Attempts made by OPOG in 1995 to confirm the location of this well were unsuccessful.

Additional shallow soil borings (SB-1 through SB-15) were advanced at the Site in late 1995. The borings were relatively shallow (i.e., they reached maximum depths of 6.5 to 6.7 feet bgs), therefore, boring logs were not prepared. Technical Memorandum No. 4 described the lithologic materials as consisting of clay with some sand and trace gravel.

In early 1996, OPOG advanced numerous deep (85 to 124 feet bgs) soil borings at the Site using a cone penetrometer (CPT) rig (H-1 through H-4/H-4A). One boring (H-5) was also advanced at an off-Site location on Putnam Street. Shallower soil borings (C-1 through C-3, and C-7/C-7A) were advanced to depths ranging from 15 to 75 feet bgs using a Geoprobe rig. The borings were located in the northern, western and southern yards. Based on soil samples and lithologic interpretations provided by the on-board CPT logging software, subsurface soils at all but one of the locations (C-3) were observed to be fine-grained (clayey silts, silts, silty clay, and clay). A coarser-grained material (silty sand) was observed in a sample collected from the bottom of the boring (75 feet bgs) at location C-3. As discussed in Section 3.3 of the Close-Out Report, this sample may be consistent with the silty and clayey sands encountered at location BMW-1 in the interval from 73 to 110 feet bgs.

Several months later, OPOG advanced a deep soil boring (SB-4) and installed a groundwater monitoring well (OW-1) in the southern yard, adjacent to the fence which separates the Site from the Terra Pave facility. The soil and well borings were advanced to 75 and 80 feet bgs, respectively. Lithologic logs for both indicated that the subsurface materials were predominately fine-grained (silts and clays).

Nine soil samples were collected from boring SB-4 and submitted for analysis of geotechnical properties. All six samples were submitted for moisture content and dry density analyses, with selected samples analyzed for grain size distribution, specific gravity, total organic carbon (TOC), effective porosity, and hydraulic conductivity. Moisture content ranged from 15 to 25%, total porosity ranged from 37.5 to 39.4%, effective porosity ranged from 14.3 to 16.2%, TOC ranged from 0.12 to 0.38%, and hydraulic conductivity ranged from 3.6×10^{-6} to 3.4×10^{-8} cm/sec.

<u>Subsurface Materials In the Vicinity of the Site</u>

In mid-1996, OPOG performed an off-Site investigation and advanced eight CPT borings (H-6 through H-13) in the vicinity of the Site. Four additional off-Site CPT (H-14 through H-17) borings were advanced in March 1997. As indicated on the CPT logs and illustrated in cross-section (Appendix A, Figure 12), subsurface materials in off-Site areas generally consisted (with one exception discussed below) of fine-grained silts and clays comparable to those found underlying the Site.

The off-Site investigation revealed the presence of a coarser-grained unit consisting of silty sand, gravelly sand, and sand. At some locations (e.g., H-6 and H-9), this unit was found interbedded with silt. This unit was first encountered at depths ranging from approximately 30 feet bgs (H-16) to 60 feet bgs (H-7). The thickness of the unit ranged from approximately 11 feet (H-11) to 31 feet (H-6). This sandy unit was also encountered during investigations conducted by others at nearby sites (e.g., Leggett-Platt and Jones Chevrolet). The Close Out Report indicated that this sandy unit was assumed to be continuous in areas downgradient of the Site. The unit apparently pinched out northeast of Putnam Street because it was not observed at the location of the well or deep borings advanced at the Site (OW-1 and H-1 through H-4/4A) or upgradient of the Site (H-2). As indicated in Appendix A, Figure 12, borings advanced through this sandy unit encountered underlying finer-grained materials.

Three off-Site wells were installed by OPOG a short distance downgradient of the Site during an investigation completed in 1999. Well OW-1b (screened from 110 to 120 feet bgs) was designed as a deeper companion well to on-Site well OW-1 (screened from 62.5 to 77.5 feet bgs). Well OW-1b was installed on Terra Pave property and wells OW-2 and OW-3 were installed on Putnam Street.

As indicated on the log contained in Appendix C, the subsurface materials at location OW1b were very uniform and consisted of fine-grained materials (silty clays) throughout the entire drilled depth of the boring (131.5 feet bgs). Some gravel imbedded in the silty clay matrix was observed in the interval from 125 to 130 feet bgs. At locations OW-2 and OW-3, the subsurface materials also consisted of silty clays to a depth of 55 and 50 feet bgs, respectively. At location OW-2, silty sand was observed in the interval from 60 to 75 feet bgs, with clayey sand observed from 80 to 85 feet bgs. Sand was observed at location OW-3 in the interval from 50 to 60 feet bgs, with clayey gravel observed from 70 to 75 feet bgs. At both locations, silty clay was observed underlying these coarser-grained materials.

The depth and thickness of the silty sand unit observed at locations OW-2 and OW-3 is comparable to the silty sand unit observed at CPT borings advanced in 1996 at off-Site boring locations. The subsurface materials observed at the three off-Site monitoring well locations supports the earlier finding that the silty sand unit is continuous downgradient of the Site (the unit was observed at locations OW-2 and OW-3) and pinches out northeast of Putnam Street (the unit was not observed at location OW-1b). As was observed during the 1996 investigation, silty clay was also observed above and below the silty sand unit at locations OW-2 and OW-3.

A geotechnical investigation for proposed additions at the nearby Presbyterian Intercommunity Hospital was performed during late 1999 (Law/Crandall, December 30, 1999). The hospital is located approximately 1,500 feet west of the Site. Four soil borings ranging in depth from approximately 40 to 50 feet bgs and two CPT borings to depths of 50 and 75 feet were advanced during the geotechnical investigation. The Presbyterian Hospital site was found to be almost entirely underlain by clay and silt with some localized layers of silty sand, sand and gravel, to the depths explored.

<u>Local Groundwater Flow and Aquifer Parameters</u>

In September 1994, water levels were measured during a four-day period at three nearby properties (Leggett & Platt, Jones Chevrolet, and former Chevron Station). Based on these measurements, the direction of groundwater flow in the vicinity of the Site was determined to be generally towards the southwest at a gradient of 0.007 (vertical feet/horizontal feet). In September 1999, based on water level measurements collected from wells OW-1 through OW-3, the direction of shallow groundwater flow was towards southwest at a gradient of 0.009.

The depth to water in on-Site well OW-1 was measured at 71.42 feet below the measuring point (bmp) during the 1999 investigation. The depth to water in deeper well OW-1b was measured at 72.58 feet bmp. As indicated in Appendix A, Table 4-1, corresponding groundwater elevations for the shallow and deeper well pair were 138.99 and 132.40 feet below mean sea level (msl), respectively. Therefore, there was a 6.48 feet difference in groundwater elevation between the two wells. This head difference suggests that some degree of hydraulic separation exists between the shallow and deeper zones. Water quality results for samples collected during 1999 from the two wells also indicate hydraulic separation between the two zones. VOC concentrations detected in shallow well OW-1b (e.g., 23,000 ug/l PCE and 1,300 ug/l TCE) were approximately two orders of magnitude lower than VOC concentrations detected in deeper well OW-1 (e.g., 300 ug/l PCE and 11 ug/l TCE). Concentrations of selected VOCs are illustrated in Appendix A, Figure 4-2.

Slug testing performed in on-Site well OW-1 during 1996 indicated a horizontal hydraulic conductivity of 0.61 feet per day. In 1999, step-drawdown testing was performed in off-Site well OW-2. Because wells OW-1b and OW-3were unable to sustain a pumping rate of one gallon per minute (gpm), step-drawdown testing was not performed at these two locations. Well OW-2 was able to sustain a maximum pumping rate of approximately 5 gpm. Step-drawdown testing results indicated a transmissivity of 15.3 to 29.1 feet ^{2}/day and horizontal hydraulic conductivity of 0.8 to 1.6 feet/day for the shallow aquifer at the location of well OW-2. The report concluded that these low hydraulic conductivities will limit the migration of VOCs laterally away from the Site.

Section 4
Regulatory Background and Site Assessments

The Omega Chemical facility (EPA ID No. CADO42245001) operated as an off-Site hazardous waste treatment and storage facility under Interim Status designation from 1976 until 1991. The operator/operator of the Omega facility during this time period was Mr. Dennis O'Meara, who remains the property owner and currently conducts business in the administrative building in the eastern portion of the property (12512 East Whittier Boulevard). A brief summary of regulatory agency interactions is provided below.

4.1 Regulatory Agency Interactions and Orders

A detailed listing of violations and enforcements for the period from April 24, 1984 through August 23, 1991, was provided in Table 2 of a Phase 1 Environmental Assessment Report prepared for Omega Chemical Corporation (Century West Engineering Corporation, May 14, 1992). A copy of Table 2 is provided in Appendix C of this document; the actual report, however, was not available for review.

As indicated on Table 2, the agency responsible for issuing several Notice of Violations (NOV) and Report of Violations (ROV) during the period from 1984 through 1991 was the California Department of Health Services (DHS). The violations were primarily associated with improperly labeled and stored hazardous waste, and various operational, safety, and administrative violations. A Consent Agreement and Order between Omega Chemical Corporation and DHS was issued on August 18, 1989. A preliminary injunction was filed by the Los Angeles County Superior Court on November 27, 1990, enjoining Omega from accepting any offsite hazardous waste.

On February 14, 1991, the San Bernardino and Los Angeles County District Attorney's offices issued warrants to search three railcars. The search found illegal storage and transport of 700 hazardous waste drums, and falsified manifests and drum labels. Due to chronic non-compliance with Interim Status standards, the Los Angeles County Superior Court ordered Omega Chemical Corporation in April 1991 to cease operation, remove all hazardous wastes, and close the facility. Omega subsequently filed Chapter 11 bankruptcy in September 1991. On October 3, 1991, USEPA entered into a Consent Order with Mr. Dennis O'Meara (Respondent) in the matter of Omega Chemical Corporation (USEPA, October 3, 1991, Administrative Order on Consent, Docket No. RCRA-09-91-0005).

The Consent Order required the Respondent to perform several Interim Measures to mitigate current or potential threats to human health or the environment (e.g., improve Site security, repack leaking drums and immediately remove them to an appropriate Class I facility), and to perform a RCRA Facility Investigation (RFI).

In August 1993, a walkthrough assessment of the Omega facility was performed by the Technical Assistance Team (TAT) under contract to USEPA. The California EPA

Department of Toxic Substances Control (DTSC) requested the assessment to evaluate the current condition of over 2,900 drums of unprocessed hazardous waste remaining on Site (correspondence from Ecology & Environment [E&E] to USEPA, August 7, 1993). The drums, often stacked three high and taking up virtually all the exterior storage areas, reportedly contained paint sludges and solvent residues. The correspondence noted that the process equipment was still being used by Omega Chemical to process non-hazardous CFC (chlorofluorocarbon) refrigerants.

On January 9, 1995, E&E representatives acting under contract to USEPA inspected the facility and video-taped current conditions at the Site. The inspection revealed numerous corroded and leaking drums, and inadequately labeled drums. Correspondence from USEPA to Mr. Dennis O'Meara dated January 30, 1995, noted that the Site appeared to pose imminent and substantial endangerment to human health and the environment, and the a representative of the Superfund Emergency Response Section would be reviewing the Site files.

As detailed in correspondence from E&E to USEPA dated March 6, 1995, additional Site assessment was performed by TAT and DTSC staff on January 18, 1995. The correspondence noted that conditions had not improved since the 1993 Site assessment, and that the owner appeared to be ignoring DTSC's requests for Site mitigation. The correspondence also noted that DTSC had identified over 3,000 contributors to the waste stored at the Site. Of these 3,000 contributors, 165 major generators had each delivered more than 10 tons of waste to the Site. On May 9, 1995, USEPA submitted a Request for a Removal Action at the Omega Chemical Site to remove and dispose of 3,113 55-gallon drums stored on-Site.

On May 9, 1995, USEPA issued Unilateral Administrative Order Docket No. 95-15 to Omega Chemical Corporation and Respondents. The scope of work was performed by OPOG in two phases, with Phase 1 work (drum removal action) completed in September 1995 and Phase 2 work (Site investigations, data evaluation, and reporting) completed October 1, 1996 with submittal of the Phase II Close Out Report. Phase 1 and 2 activities and findings are discussed in the following section.

As previously discussed in Section 1, a Consent Decree and Scope of Work for additional activities was developed by OPOG and USEPA. The effective date of the current Consent Decree is February 28, 2001.

4.2 Previous Site Assessment Activities

The results of previous Site assessment activities are discussed below. Figures and tables from historical documents which illustrate historical sampling results are provided in Appendix A. Tables 4-1 through 4-11 were generated from the recently developed project database, and may be found at the rear of this section. Figure 4-1, which is also found at the rear of this section, illustrates the approximate locations of all historical sampling locations.

LeRoy Crandall and Associates, 1985. Investigation of Subsurface Soil Contamination at Tank Farm, Omega Chemical Corporation, June 26.

A total of six borings (Borings 1, 1a, and 2 through 5) were advanced in the tank farm area by hand auger to depths of six and seven feet below ground surface between April and May 1985. The investigation was completed to address the Los Angeles County Department of Health Services Violation notice issued April 5, 1985 to Omega Chemical to assess the extent of contamination observed at the tank farm. Results of the investigation, showed concentrations of methylene chloride, 1,1,1-TCA, TCE, PCE, and 1,2-DCA in the soil. However, the highest concentrations appeared to be limited to the upper 3 feet of each boring.

Leighton and Associates, Inc., 1987. Results of Laboratory Analysis Performed on Soil Samples Collected after the Removal of an Underground Tank Located on the Fred Rippy Trust Property, August 26.

On August 8, 1987, one 500-gallon underground tank was removed from the Site. The tank was located adjacent to and west of the chemical recycle/loading dock area. The bottom of the tank was approximately eight feet below grade. During excavation of the tank, it was observed that the roof of the west end of the tank was badly corroded and a strong solvent odor was also noted. Two soil samples were collected (E-1 and E-2) from 10 and 12 feet below grade and three soil samples were collected from the stockpiled soils (SP-1, SP2-A and SP2-B). Elevated levels of VOCs (e.g., 13,000 µg/kg acetone; 3,500 µg/kg 1,1-TCA; 3,000 µg/kg PCE; and 1,700 µg/kg methylene chloride) were detected in sample E-2 collected at a depth of 12 feet. Additional investigation to evaluate the lateral and vertical extent of soil contamination was recommended.

ERT, 1988. Report on Soil Vapor Survey of Fred R. Rippy Trust Real Estate Property, February 2.

In January 1988, a soil vapor survey consisting of eighteen sample points (S1 through S16, and S21 and S22) was completed throughout the Site. Hydrocarbon vapors were detected in most of the samples, with the exception of the northeastern side of the Site, along Whittier Boulevard. The report recommended additional investigation and the collection of soil samples for laboratory analysis to evaluate the lateral and vertical extent of contamination. Sample analysis was performed in the field using a portable gas chromatograph, with results reported as "total readings" which did not indicate the unit of measurement. These results, therefore, are considered "qualitative" and not "quantitative". The 1988 soil gas sampling results, therefore, were not included in the Omega database or summarized in Tables 4-1 or 4-2. The majority of these sampling points were resampled during a 1996 soil gas investigation at the Site (see Phase II Close Out Report and TM2 discussion below).

ENSR, 1988. Report on Site Assessment Investigations at Omega Recovery Facility, October 14.

In March and June 1988, four soil borings (B-1 through B-3 and BMW-2) were advanced and one groundwater monitoring well (BMW-1) was constructed at the Site to evaluate the presence of impacted soil and groundwater as a result of the January 1988 soil vapor survey (ERT, 1988). PCE, MC, TCE and Freon 113 and a number of other VOCs were detected in the soil and groundwater samples. Concentrations of methylene chloride, PCE and Freon 113 were detected above maximum contaminant levels (MCLs). The conclusions of the investigation indicated that VOCs were present in the subsurface soils and uppermost groundwater at the Site.

England and Associates and Hargis + Associates, Inc, 1996. Phase II Close Out Report, Omega Chemical Site, October 1.

The Phase II Close Out Report summarizes the results of various investigations completed by OPOG between December 1995 and September 1996 to fulfil the requirements of USEPA Administration Order 95-15. A summary of the field activities and the results of the individual tasks performed as part of the Phase II Investigation were summarized within Technical Memorandum (TM) Nos. 1 through 9, which are included in the Close Out Report. Brief descriptions of each TM and submittal dates are provided below:

TM No.	Date	Description
1	12/1/95	Attempted location of monitoring well BMW-1
2	12/6/95	Results of Soil Gas Survey (SG-1 though SG-31).
3	1/19/96	Surface dewatering procedures/collection of surface water samples.
4	1/22/96	Results of shallow soil sampling (SB-1 through SB-15).
4A	1/25/96	Proposed supplemental shallow soil sampling/on and off-Site CPT.
5	2/22/96	Removal/treatment contaminated material (loading dock sump).
5A	6/26/96	Excavation/removal of loading dock sump materials.
6	3/6/96	Results of on-Site CPT/Hydropunch investigation (H-1 through H-4, C1 through C-3 and C-7A) and proposal for additional investigation.
6A	7/8/96	Procedures for proposed testing of vapor extraction well (VES-1).
7	3/26/96	Modification to frequency of progress reports.
8	6/26/96	Results of soil boring (B-4), well OW-1 (installation/slug testing) anc VES-1, and proposal for off-Site groundwater investigation.
9	9/24/96	Plan for removal/off-Site disposal of investigation derived waste.

Historical tables from the Close Out Report have not been included in Appendix A. Instead, analytical results from post-1988 investigations are summarized in Tables 4-1 through 4-11 located at the rear of this section. These tables were generated using commercially available software (Microsoft Access). The information in the tables has been organized and summarized according to method of analysis (chlorinated VOCs, aromatic VOCs, metals, etc.) and sample matrix (soil gas, soil and groundwater).

The Phase II Investigation concluded that the principal contaminants at the Site were VOCs, primarily PCE and related compounds, which were detected in soil and groundwater. In on-Site soil gas samples, the primary VOCs detected were Freon 113, Freon 11, PCE and TCA. Figure 14 (see Appendix A), indicates that Freon 113 was apparently derived from the adjacent Cal Air property. No dense non-aqueous phase liquids (DNAPLs) were identified at any of the historical sampling locations. The Executive Summary of the Close Out Report is contained in its entirety in Appendix A of this document. The following is a brief discussion of Close Out Report findings. For a more in-depth review, please review the Executive Summary of the Close Out Report.

According to the Close Out Report, the highest VOC concentrations were detected in the soil and soil gas within the soil-filled loading dock sump. Total VOCs were greater than 3,000 mg/kg. Soil gas concentrations decreased rapidly with distance from the sump. Approximately 8 cubic yards of soil contained within the loading dock sump were excavated and disposed of at an EPA-approved facility.

Elsewhere on the Site, concentrations of PCE within the vadose zone ranged from 0.01 to 510 mg/kg. PCE was the predominant VOC found in groundwater. A maximum concentration of 86,000 ug/l PCE was detected at Hydropunch sampling location H-4, located a short distance downgradient of the loading dock sump. A maximum PCE concentration of 81,000 ug/l was detected in on-Site monitoring well OW-1. PCE and other VOCs were detected at elevated concentrations in all of the off-Site Hydropunch sampling locations. Section 2.6.3 of the Close Out Report provides a description of off-Site groundwater sampling activities performed as proposed in TM No. 8. Analytical results of the off-Site groundwater investigation (CPT sample locations H-6 through H-13) are summarized in Tables 4-8 and 4-9 and illustrated in Appendix A, Figure 17.

The report found that the dissolved phase PCE plume extended downgradient from the Site approximately 1,700 feet southwest. Methylene chloride and chloroform were found in groundwater samples collected downgradient of the Site and appeared to be from an off-Site source. The nearest water supply well located approximately 7,000 feet downgradient of the Site (City of Santa Fe Springs well 30-R3) was reported to contain TCE and chloroform at concentrations below their respective MCLs. However, it was reported that the VOCs detected in this well were likely from other off-site sources downgradient of Omega, and do not reflect contamination from the Site. Based on levels of total dissolved solids (TDS) exceeding 3,000 milligrams per liter, groundwater beneath the Site is not suitable, or potentially suitable, for municipal or domestic water supply.

The report concluded that the potential, if any, for imminent or substantial endangerment arising from current conditions at the Site was very low. Grossly contaminated near-surface soils in the loading dock sump had been removed, and soils impacted by VOCs were located beneath concrete and were not exposed at the surface. In addition, no complete human exposure pathway to groundwater impacted by VOCs originating at the Site was established.

C_2 Rem, 1997. Technical Memorandum No. 11, Final Off-Site CPT/Hydropunch Investigation, Omega Chemical Site, February 10.

TM11 detailed procedures for implementation of a proposed off-Site CPT/Hydropunch investigation. According to TM11, the proposed work was the final task to be completed under USEPA Order 95-15. The purpose of the proposed investigation was to verify modeling results which indicated that VOC concentrations decreased to below the MCLs at a distance of approximately 3,000 feet downgradient from the Site.

C_2 Rem, 1997. Technical Memorandum No. 11A, Results of Offsite CPT/Groundwater Investigation, Omega Chemical Site, April 30.

The findings of the off-Site CPT/Hydropunch investigation performed in March 1997 were documented in TM11A. In-situ groundwater samples were collected from four locations (H-14 through H-17). In addition, water levels were measured and existing on-Site well OW-1 was sampled. The TM concluded that the direction of groundwater flow was generally towards the west/southwest and that elevated levels of VOCs were present further downgradient than predicted by groundwater modeling. VOC concentrations at sampling locations H-16 and H-17, located approximately 4,800 feet downgradient of the Site, were 71 and 580 µg/l PCE, 3.6 and 45 µg/l TCE, 4.5 and 133.8 µg/l 1,2-DCE, and 3.6 and 45 µg/l Freon 11, respectively. Figures and tables depicting the results of the off-Site groundwater investigation are included in Appendix A.

Camp Dresser & McKee Inc., 1999. Phase 1a Field Investigation Final Sampling and Analysis Plan, Omega Chemical Superfund Site, April 23.

In order to evaluate the extent of groundwater contamination at and immediately downgradient of the Site, CDM prepared a SAP for the installation of three groundwater monitoring wells. The wells were proposed for the Phase 1a area, which consists of the Omega property and an area extending downgradient approximately 100 feet southwest of Putnam Street. Aquifer testing and water quality sampling were also proposed in order to evaluate aquifer parameters and contaminant concentrations at the three off-Site well locations.

Camp Dresser & McKee Inc., 1999. Draft Phase 1a Pre-Design Field Investigation Report, Omega Chemical Superfund Site, October 13.

During June and July 1999, CDM implemented the April 23, 1999 SAP for the Phase 1a field investigation. Three wells (OW-1b, OW-2 and OW-3) were installed and developed. Water table wells OW-2 and OW-3 were installed on Putnam Street, and deeper well OW-1b was installed on the adjacent Terra Pave facility. Well OW-1b was designed as a deeper companion well to on-Site water table well OW-1.

Soil samples for laboratory analysis were collected from all three monitoring well borings during drilling. In addition, soil gas samples for laboratory analysis were also collected during drilling at location OW-1b. All samples were submitted for VOC analysis plus analysis for acetone and Freon 113. Reporting of any tentatively identified compounds (TICs) was also requested.

Several VOCs (PCE, TCE, 1,1,1-TCA, 1,1-DCE, chloroform, Freon 113 and Freon 11) were detected in the soil gas samples. PCE concentrations generally increased with depth and ranged from 150,000 parts per billion volume/volume (ppbv) at a depth of 10 feet bgs to 6,100,000 ppbv at 60 feet bgs. Concentrations were generally significantly lower in the interval from 10 to 30 feet bgs than in the interval from 40 to 60 feet bgs, and appeared to be related to proximity to groundwater.

PCE was the compound most frequently detected in soil samples collected during the investigation, and ranged in concentration at location OW-1b from 4.7 ug/kg at a depth of 120 feet bgs to 3,300 ug/kg at a depth of 70 feet bgs. A significant decline (i.e., one to two orders of magnitude) was observed in soil samples collected below a depth of 90 feet bgs. At off-Site location OW-2, PCE concentrations were significantly lower and ranged from 4.8 ug/kg (80 feet bgs) to 92 ug/kg (60 feet bgs). At off-Site location OW-3, PCE concentrations were also significantly lower (ranged from 2.9 to 80 ug/kg at depths of 50 and 40 feet bgs, respectively). As was noted above for soil gas concentrations, elevated VOC concentrations in the soil appeared to be related to proximity to groundwater.

Step-drawdown testing to a maximum rate of 5.5 gallons per minute (gpm) was performed on well OW-2. Wells OW-1b and OW-3 were not capable of sustaining a minimal pumping rate of one gpm, therefore, they were not step-drawdown tested. VOC concentrations in deeper well OW-1b (screened from 110 to 120 feet bgs) compared to water table well OW-1 were generally two orders of magnitude lower in comparison to the concentrations detected in water table well OW-1 (screened from 62.5 to 77.5 feet bgs).

EPA approved the draft report in correspondence dated December 21, 1999. Because USEPA's comments were not extensive, revision and re-submittal of the report was not required.

4.3 Data Quality Evaluation

The analytical data currently contained in the database may be divided into three categories, as follows: 1) preliminary work performed by Law/Crandall, ERT and ENSR from 1985 through 1988, 2) detailed and focused Phase II investigation work performed by England/Hargis and C_2Rem from 1995 through 1997, and 3) Phase 1a pre-design investigation performed by CDM during 1999. The quality of the analytical results is discussed below.

4.3.1 Preliminary Investigations

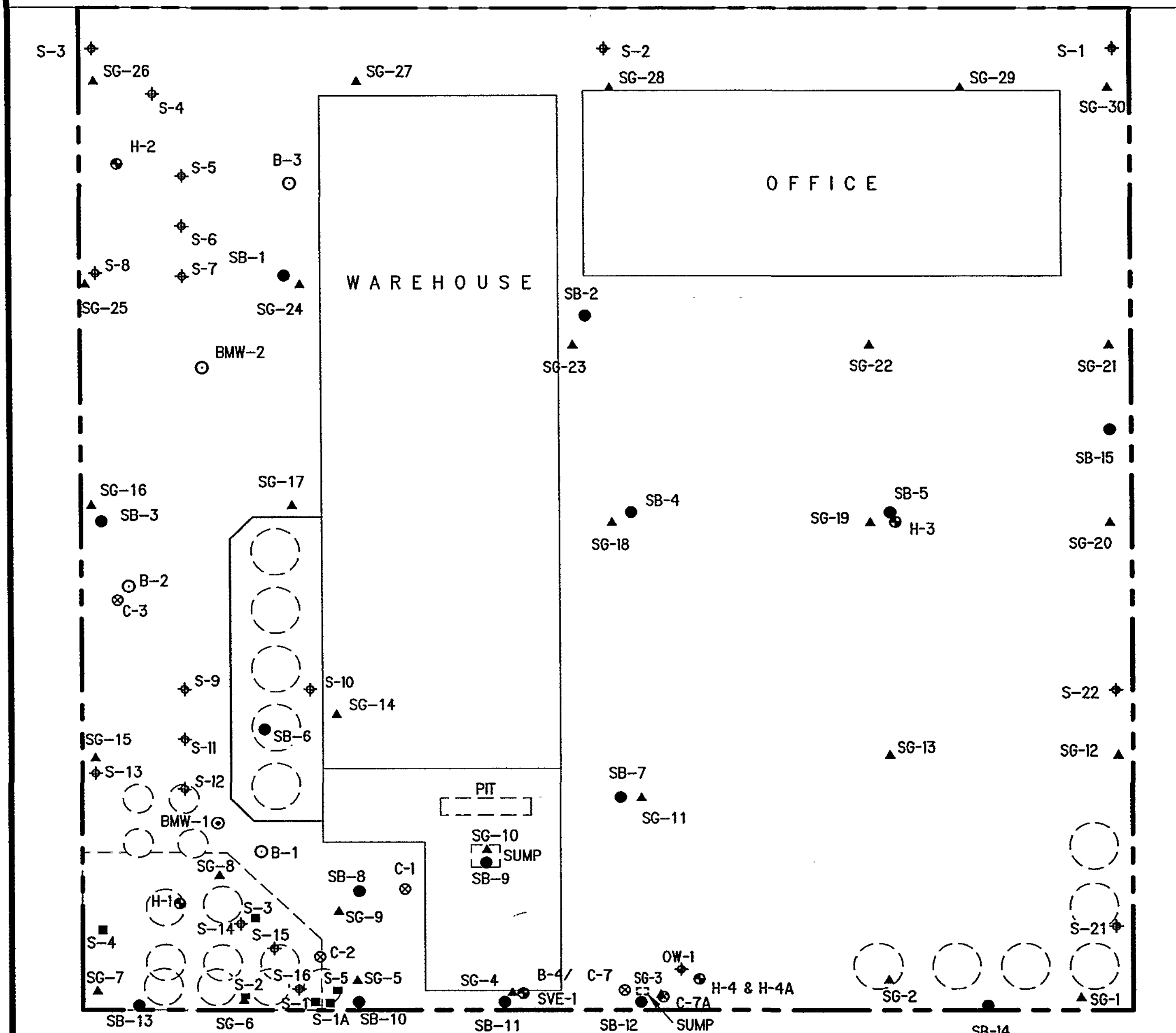
As discussed previously, soil gas samples collected in 1988 were analyzed in the field and were not submitted to an off-Site laboratory for analysis. These results were not included in the project database because they were considered qualitative and not quantitative. A limited number of soil and groundwater samples were collected during the time period from 1985 through 1988 and submitted to an off-Site laboratory for analysis. While these results were quantitative, insufficient information was presented in the historical reports to evaluate the quality of the data. For this reason, soil and groundwater results for samples collected during 1985 through 1988 were also not included in the project database.

4.3.2 Phase II Investigation

The Phase II work was performed under USEPA direction and oversight. Appendix B of the Phase II Close Out Report provided a detailed description of data assessment and validation procedures used to evaluate the quality of the Phase II data. Satisfactory analytical results were assigned the qualifier "S", with estimated results assigned the qualifier "E". No results were assigned an unsatisfactory "U" qualifier. "E" qualified results (selected VOCs for 3 soil samples, 4 groundwater samples, and 2 other samples) were summarized in Table 4-1 of the Close Out Report, which has been included in Appendix A of this document.

4.3.3 Phase 1a Pre-Design Work

CLP-like deliverables (Level IV) were requested for all soil, soil gas, and groundwater samples submitted for analysis during the Phase 1a pre-design investigation. The analytical laboratory also provided the analytical results electronically for inclusion in the project database. Because CLP-like deliverables include all QA/QC and raw data (initial and continuing calibrations, tune reports, run logs, quantitation reports, and chromatograms), formal data validation was performed on a minimum 10% of the samples. All criteria evaluated during data validation were found to be within acceptable limits. Therefore, all data were considered usable without qualification. The data validation results were included as Appendix D of the Phase 1a Pre-Design Field Investigation Report.



LEGEND
- Leroy Crandall Soil Boring (1985)
- ENSR Soil Boring (1988)
- ENSR Groundwater Monitoring Well (1988)
- England/Hargis Soil Boring (January 1996)
- England/Hargis Soil Gas Sample (December 1995)
- England/Hargis Monitoring Well (June 1996)
- England/Hargis Hydropunch (March 1996)
- England/Hargis Soil Boring (March 1996)
- ERT Soil Gas Sample (1988)
- Feature Removed

N

1" = 30'

15 0 30

Note: All locations approximate. Features based on Oct. 28, 1984 aerial photo and Figure 1 of England/Hargis Phase II Close Out Report

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OMEGA CHEMICAL

CDM

environmental engineers, scientists, planners, & management consultants

Historical Sample Locations

Figure 4-1

Table 4-1
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Soil Gas Analytical Results

Borehole ID	Sample Depth (ft)	Sample Date	PCE	TCE	1,1,1-TCA	1,1,2-TCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCA	1,2-DCA	DFM	CFM	MCL	Freon 113	Freon 11	VC
SG-1	6	11/13/95	0	0	0		0	0	0	0	0	0	0	0	0	0	
	12	11/13/95	0	0	0		0	0	0	0	0	0	0	0	0	0	
SG-2	6	11/13/95	82509	10046	53973		16594	2909	0	14303	0	0	3417	0	92209	34934	
	12	11/13/95	50663	7123	62969		12136	1770	866	8242	1503	4764	3216	16678	92209	45415	
SG-3	6	11/13/95	120145	1114	10435		718	0	0	0	0	0	0	0	15368	3144	
	12	11/13/95	448733	2557	19790		2724	0	965	461	606	4764	1628	537	49947	15721	
SG-3D	6	11/13/95	101327	1187	10435		867	0	0	0	0	0	0	0	14088	2096	
SG-4	6	11/13/95	188179	13516	269865		56966	0	5196	6303	13576	0	2814	18940	550694	36681	
	12	11/13/95	202654	12968	269865		81734	0	3216	5091	7030	0	4422	14134	832444	45415	
	16.7	11/13/95	0	0	0		0	0	0	0	0	0	0	0	0	0	
SG-5	6	11/13/95	99879	21918	287856		79257	0	2722	6303	19152	0	5628	0	473853	36681	
	12	11/13/95	91194	17717	287856		101548	0	2722	8000	16727	0	5829	0	563501	47162	
SG-6	6	11/13/95	43426	2740	43178		32198	0	0	1455	0	0	945	0	71718	13450	
	12	11/13/95	37636	3470	61169		71827	0	0	2255	0	0	1990	0	166489	24454	
SG-7	6	11/13/95	11435	2374	16732		47059	0	0	630	0	0	643	0	111419	33188	
	12	11/13/95	15923	3470	25187		94118	0	0	1236	0	0	1467	0	230523	59389	
SG-8	6	11/13/95	0	0	0		0	0	0	0	0	0	0	0	0	0	
	12	11/13/95	6659	1352	25187		34675	0	841	2424	0	0	342	0	117823	36681	
SG-9	6	11/13/95	108565	15525	305847		195666	0	2969	23758	10667	2779	4824	0	653148	143231	
	12	11/13/95	111460	18265	269865		185759	0	2004	19394	12364	0	4824	0	589114	131004	
SG-9D	12	11/13/95	121592	19178	287856		210526	0	1682	19879	13818	0	5628	0	653148	134498	
SG-10	6	11/13/95	303981	347032	0		297214	0	0	0	196364	694789	136683	0	0	0	

Table 4-1
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Soil Gas Analytical Results

Borehole ID	Sample Depth (ft)	Sample Date	PCE	TCE	1,1,1-TCA	1,1,2-TCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCA	1,2-DCA	DFM	CFM	MCL	Freon 113	Freon 11	VC
SG-10R	6	11/13/95	104222	584475	011994		1040248	0	2301031	630303	1187879	8535980	180905	38162544	)7577375	3427948	
SG-11	6	11/13/95	133172	7854	91754		76780	0	1163	2012	0	0	2010	0	397012	174672	
	12	11/13/95	144753	12968	152924		118885	0	2722	4121	0	0	1930	0	768410	366812	
SG-11D	12	11/13/95	107117	10776	136732		106502	0	0	2255	0	0	1869	0	729989	366812	
SG-12	6	11/13/95	0	438	0		0	0	0	0	0	1806	0	311	896	489	
	12	11/13/95	2171	384	5937		23529	0	0	291	0	0	0	0	166489	71616	
SG-13	6	11/13/95	60796	8402	57571		128793	461	0	6788	0	0	3015	0	704376	192140	
	12	11/13/95	23160	4201	30585		66873	0	0	2909	0	0	3618	0	320171	76856	
SG-14	6	11/13/95	2316	237	720		768	0	0	0	0	0	0	0	3842	1450	
	12	11/13/95	52111	11324	44978		113932	0	2449	3152	364	1092	1206	0	614728	262009	
SG-15	6	11/13/95	0	0	0		0	0	0	0	0	0	0	0	0	0	
	12	11/13/95	0	0	0		0	0	0	0	0	0	0	0	0	0	
SG-16	6	11/13/95	13028	8037	7016		99071	0	3464	2667	242	2382	1286	0	1152615	174672	
	12	11/13/95	14475	9132	5757		79257	0	619	0	0	2779	1045	0	934899	153712	
	24	11/13/95	709	493	720		5697	0	0	0	0	0	0	0	69157	17467	
SG-17	6	11/13/95	18818	7489	8996		91641	0	0	1018	0	4764	844	0	960512	171179	
	12	11/13/95	20265	7854	9715		89164	0	1039	291	0	3970	744	0	832444	144978	
SG-18	6	11/13/95	31846	7123	17631		113932	0	0	315	0	0	0	0	1011740	279476	
	12	11/13/95	4632	1479	5577		39628	0	0	0	0	0	0	0	320171	92576	
SG-19	6	11/13/95	12304	5297	13673		101548	0	0	3879	0	0	0	0	665955	122271	
	12	11/13/95	18818	10959	32384		205573	0	0	3636	0	0	302	0	1536820	349345	
	24	11/13/95	0	0	612		3220	0	0	0	0	0	0	0	34578	7336	

Table 4-1
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Soil Gas Analytical Results

Borehole ID	Sample Depth (ft)	Sample Date	PCE	TCE	1,1,1-TCA	1,1,2-TCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCA	1,2-DCA	DFM	CFM	MCL	Freon 113	Freon 11	VC
SG-19D	24	11/13/95	0	0	702		3220	0	0	0	0	0	0	0	34578	6987	
SG-20	6	11/13/95	5790	3288	8096		76780	0	0	2279	0	0	0	0	384205	122271	
	12	11/13/95	0	0	378		1090	0	0	0	0	0	0	0	1921	0	
SG-20D	12	11/13/95	1592	457	2339		27988	0	0	0	0	0	0	0	192102	36681	
SG-21	6	11/13/95	854	1662	2879		29721	0	0	0	0	0	0	0	435432	6812	
	12	11/13/95	2606	5845	26987		61920	0	816	630	703	0	0	0	1011740	125764	
SG-22	6	11/13/95	2461	4018	8276		54489	0	0	921	0	0	0	0	832444	134498	
	12	11/13/95	2171	2557	1493		6935	0	0	0	0	0	0	0	94771	8734	
SG-23	6	11/13/95	5790	3470	4138		39628	0	0	0	0	0	0	0	1011740	127511	
	12	11/13/95	941	639	720		6935	0	0	0	0	0	0	0	179296	20961	
SG-24	6	11/13/95	7527	5114	1259		29721	0	0	0	0	933	261	0	922092	96070	
	12	11/13/95	7382	4932	1079		29721	0	0	0	0	1092	241	0	870864	99563	
SG-25	6	11/13/95	767	0	558		0	0	0	0	0	0	0	0	0	0	
	12	11/13/95	232	0	0		0	0	0	0	0	0	0	0	0	0	
SG-26	6	11/13/95	579	0	0		916	0	0	0	0	0	0	0	112700	8035	
	13	11/13/95	0	0	0		0	0	0	0	0	0	0	0	26894	2620	
SG-26D	13	11/13/95	0	0	0		248	0	0	0	0	0	0	0	26254	2096	
SG-27	6	11/13/95	0	0	0		0	0	0	0	0	0	0	0	6403	0	
	12	11/13/95	0	0	3778		0	0	0	0	0	0	0	2827	8068	4192	
SG-28	6	11/13/95	565	0	0		693	0	0	0	0	0	0	0	217716	12751	
	12	11/13/95	0	0	0		0	0	0	0	0	0	0	0	39701	4017	
SG-29	6	11/13/95	0	0	0		1511	0	0	0	0	0	0	0	106297	8908	

Table 4-1
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Soil Gas Analytical Results

Borehole ID	Sample Depth (ft)	Sample Date	PCE	TCE	1,1,1-TCA	1,1,2-TCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCA	1,2-DCA	DFM	CFM	MCL	Freon 113	Freon 11	VC
SG-29	12	11/13/95	622	694	3238		1214	0	272	0	0	0	0	2290	81964	9258	
SG-30	6	11/13/95	0	402	0		2279	0	0	0	0	0	0	0	294557	36681	
	12	11/13/95	0	0	0		0	0	0	0	0	0	0	0	2049	0	
SG-31	3.5	11/13/95	0	0	0		0	0	0	0	0	0	0	0	0	0	
OW1b	10	06/16/99	150000	9100	1900	1700 U	19000	1700 U	1700 U	1700 U	1700 U	1700 U	3000	1700 U	60000	9700	1700 U
	20	06/16/99	240000	9200	3600 U	3600 U	18000	3600 U	3600 U	3600 U	3600 U	3600 U	5500	3600 U	51000	7000	3600 U
	30	06/16/99	360000	10000	5000	3600 U	23000	3600 U	3600 U	3600 U	3600 U	3600 U	11000	3600 U	28000	4500	3600 U
	40	06/16/99	2800000	40000	58000	18000 U	130000	18000 U	18000 U	18000 U	18000 U	18000 U	59000	18000 U	130000	19000	18000 U
	50	06/16/99	2500000	24000	44000	18000 U	64000	18000 U	18000 U	18000 U	18000 U	18000 U	44000	18000 U	34000	18000 U	18000 U
	60	06/16/99	6100000	72000 U	190000	72000 U	170000	72000 U	72000 U	72000 U	72000 U	72000 U	72000 U	72000 U	130000	72000 U	72000 U

Notes:

Concentrations are reported in ppb (v/v).
Only chlorinated compounds detected in one or more soil gas samples are reported.
Samples collected in 1999 were analyzed by EPA Method TO-14. Unknown method used for samples analyzed in 1995.

U = Not detected at a concentration greater than the reporting limit shown.
If left blank, analyte was either not reported or not analyzed.

PCE = Tetrachloroethene; TCE = Trichloroethene; TCA = Trichloroethane; DCE = Dichloroethene; DCA = Dichloroethane; DFM = Dichlorofluoromethane; CFM = Chloroform; MCL = Methylene chloride; Freon 113 = 1,1,2-Trichloro-1,2,2-trifluoroethane; Freon 11 = Trichlorofluoromethane; and VC = Vinyl chloride.

Table 4-2
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Soil Gas Analytical Results

Borehole ID	Sample Depth	Sample Date	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene	Total Xylenes	Acetone
SG-1	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-2	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-3	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-3D	6	11/13/95	0	0	0	0	0		
SG-4	6	11/13/95	430	0	0	0	294		
	12	11/13/95	492	339	362	475	1107		
	16.7	11/13/95	0	0	0	0	0		
SG-5	6	11/13/95	430	0	0	249	0		
	12	11/13/95	522	0	0	0	0		
SG-6	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-7	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-8	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-9	6	11/13/95	676	0	0	362	0		
	12	11/13/95	676	0	0	249	0		
SG-9D	12	11/13/95	830	0	0	294	0		
SG-10	6	11/13/95	7990	70358	1107	3390	678		
SG-10R	6	11/13/95	0	39088	0	0	0		
SG-11	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-11D	12	11/13/95	0	0	0	0	0		
SG-12	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-13	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-14	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-15	6	11/13/95	0	0	0	0	0		

Table 4-2
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Soil Gas Analytical Results

Borehole ID	Sample Depth	Sample Date	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene	Total Xylenes	Acetone
SG-15	12	11/13/95	0	0	0	0	0		
SG-16	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
	24	11/13/95	0	0	0	0	0		
SG-17	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-18	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-19	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
	24	11/13/95	0	0	0	0	0		
SG-19D	24	11/13/95	0	0	0	0	0		
SG-20	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-20D	12	11/13/95	0	0	0	0	0		
SG-21	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-22	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-23	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-24	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-25	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-26	6	11/13/95	0	0	0	0	0		
	13	11/13/95	0	0	0	0	0		
SG-26D	13	11/13/95	0	0	0	0	0		
SG-27	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-28	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-29	6	11/13/95	0	0	0	0	0		

Table 4-2
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Soil Gas Analytical Results

Borehole ID	Sample Depth	Sample Date	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene	Total Xylenes	Acetone
SG-15	12	11/13/95	0	0	0	0	0		
SG-16	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
	24	11/13/95	0	0	0	0	0		
SG-17	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-18	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-19	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
	24	11/13/95	0	0	0	0	0		
SG-19D	24	11/13/95	0	0	0	0	0		
SG-20	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-20D	12	11/13/95	0	0	0	0	0		
SG-21	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-22	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-23	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-24	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-25	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-26	6	11/13/95	0	0	0	0	0		
	13	11/13/95	0	0	0	0	0		
SG-26D	13	11/13/95	0	0	0	0	0		
SG-27	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-28	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-29	6	11/13/95	0	0	0	0	0		

Table 4-2
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Soil Gas Analytical Results

Borehole ID	Sample Depth	Sample Date	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene	Total Xylenes	Acetone
SG-29	12	11/13/95	0	0	0	0	0		
SG-30	6	11/13/95	0	0	0	0	0		
	12	11/13/95	0	0	0	0	0		
SG-31	3.5	11/13/95	0	0	0	0	0		
OW1b	10	6/16/99	1700 U	1700 U	1700 U			1700 U	8700 U
	20	6/16/99	3600 U	3600 U	3600 U			3600 U	18000 U
	30	6/16/99	3600 U	3600 U	3600 U			3600 U	18000 U
	40	6/16/99	18000 U	18000 U	18000 U			18000 U	90000 U
	50	6/16/99	18000 U	18000 U	18000 U			18000 U	90000 U
	60	6/16/99	72000 U	72000 U	72000 U			72000 U	360000 U

Notes:

Concentrations are reported in ppb (v/v).
Only chlorinated compounds detected in one or more soil gas samples are reported.
Samples collected in 1999 were analyzed by EPA Method TO-14. Unknown method used for samples analyzed in 1995.

U = Not detected at a concentration greater than the reporting limit shown.
If left blank, analyte was either not reported or not analyzed.

Table 4-3
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Soil Analytical Results

Borehole ID	Sample Depth (ft)	Sample Date	Sample Type	PCE	TCE	1,1,1-TCA	1,1,2-TCA	1,1-DCE	trans-1,3-DCP	1,2-DCA	CFM	MCL	Freon 113	Freon 11
PIT-0.5	0.5	9/12/96	ORIG	7.8	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
PIT-5.0	5	9/12/96	ORIG	6.6	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
SUMP-0.5	0.5	9/12/96	ORIG	9.1	0.5 U	0.95	0.5 U	0.5 U	0.5 U	1.6	0.5 U	0.5 U	1 U	0.5 U
SUMP-5	5	9/12/96	ORIG	11	1 U	1 U	1 U	1 U	1 U	1	1 U	1 U	2 U	1 U
B-4	5	5/23/96	ORIG	510	50 U	15	50 U	50 U	50 U	50 U	50 U	50 U	100 U	50 U
	10	5/23/96	ORIG	1.9	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	15	5/23/96	ORIG	9.8	0.5 U	1.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	20	5/23/96	ORIG	11	0.5 U	1.1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	30	5/23/96	ORIG	5.2	0.5 U	0.85	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	45	5/23/96	ORIG	8.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	55	5/23/96	ORIG	56	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	5 U	3 U
	65	5/23/96	ORIG	27	1 U	1.5	1 U	1 U	1 U	1 U	1 U	1.4	2 U	1 U
	70	5/23/96	ORIG	11	0.5 U	0.67	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	4.2	1 U	0.5 U
	75	5/23/96	ORIG	16	0.54	0.96	0.5 U	0.99	0.5 U	0.5 U	0.5 U	2.4	0.98	0.5 U
C-1	15	1/30/96	ORIG	0.45	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.15	0.03 U	0.03 U	0.05 U	0.03 U
	30	1/30/96	ORIG	1.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	45	1/30/96	ORIG	2.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
C-2	15	1/30/96	ORIG	3.4	0.5 U	0.6	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	30	1/30/96	ORIG	1.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	45	1/30/96	ORIG	6.9	0.5 U	0.77	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U

Table 4-3
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Soil Analytical Results

Borehole ID	Sample Depth (ft)	Sample Date	Sample Type	PCE	TCE	1,1,1-TCA	1,1,2-TCA	1,1-DCE	trans-1,3-DCP	1,2-DCA	CFM	MCL	Freon 113	Freon 11
C-2	53	1/30/96	ORIG	8.1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
C-3	15	2/1/96	ORIG	0.15	0.024 U	0.005 U	0.0069	0.0074	0.024	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
	30	2/1/96	ORIG	0.17	0.03	0.03 U	0.03 U	0.035	0.03 U	0.03 U	0.03 U	0.03 U	0.078	0.046
	45	2/1/96	ORIG	0.81	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	60	2/1/96	ORIG	0.15	0.024	0.013	0.005 U	0.12	0.005 U	0.005 U	0.005 U	0.012	0.01 U	0.005 U
	75	2/1/96	ORIG	0.033	0.014	0.005 U	0.005 U	0.013	0.005 U	0.005 U	0.005 U	0.005 U	0.15	0.037
C-7	15	2/1/96	ORIG	6.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
C-7A	15	2/1/96	ORIG	0.79	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	30	2/1/96	ORIG	2.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	45	2/1/96	ORIG	7.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.54	0.5 U	0.5 U	1 U	0.5 U
	52	2/1/96	ORIG	37	1 U	1 U	1 U	1 U	1 U	2.1	1 U	1 U	2 U	1 U
OW1b	35	6/16/99	ORIG	2.1	0.02 U	0.02 U	0.02 U	0.05 U	0.02 U	0.02 U	0.043	0.2 U	0.05 U	0.05 U
	45	6/16/99	ORIG	0.83	0.02 U	0.02 U	0.02 U	0.05 U	0.02 U	0.053	0.043	0.2 U	0.05 U	0.05 U
	55	6/16/99	ORIG	2.1	0.02 U	0.04	0.02 U	0.05 U	0.02 U	0.19	0.062	0.2 U	0.05 U	0.05 U
	60	6/16/99	ORIG	0.33	0.0054	0.0079	0.002 U	0.005 U	0.002 U	0.14	0.02	0.02 U	0.005 U	0.005 U
	65	6/16/99	ORIG	1.7	0.1 U	0.1 U	0.1 U	0.25 U	0.1 U	0.73	0.1 U	1 U	0.25 U	0.25 U
	70	6/16/99	ORIG	3.3	0.1 U	0.1 U	0.1 U	0.25 U	0.1 U	0.39	0.1 U	1 U	0.25 U	0.25 U
	75	6/16/99	ORIG	2	0.1 U	0.14	0.1 U	0.25 U	0.1 U	0.1 U	0.1 U	1 U	0.25 U	0.25 U
	80	6/16/99	ORIG	0.71	0.02 U	0.029	0.02 U	0.05 U	0.02 U	0.03	0.02 U	0.2 U	0.05 U	0.05 U
	90	6/16/99	ORIG	0.85	0.049	0.038	0.02 U	0.05 U	0.02 U	0.073	0.051	0.2 U	0.05 U	0.05 U

Table 4-3
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Soil Analytical Results

Borehole ID	Sample Depth (ft)	Sample Date	Sample Type	PCE	TCE	1,1,1-TCA	1,1,2-TCA	1,1-DCE	trans-1,3-DCP	1,2-DCA	CFM	MCL	Freon 113	Freon 11
OW1b	100	6/18/99	ORIG	0.02	0.002 U	0.002 U	0.002 U	0.005 U	0.002 U	0.003	0.002 U	0.02 U	0.005 U	0.005 U
	110	6/18/99	ORIG	0.012	0.002 U	0.002 U	0.002 U	0.005 U	0.002 U	0.002 U	0.002 U	0.02 U	0.005 U	0.005 U
	120	6/18/99	ORIG	0.0047	0.002 U	0.002 U	0.002 U	0.005 U	0.002 U	0.002 U	0.0023	0.02 U	0.005 U	0.005 U
OW2	45	6/17/99	ORIG	0.047	0.0042	0.002 U	0.002 U	0.006	0.002 U	0.002 U	0.002 U	0.02 U	0.005 U	0.005 U
	60	6/17/99	ORIG	0.092	0.0072	0.0032	0.002 U	0.021	0.002 U	0.002 U	0.002 U	0.02 U	0.005 U	0.005 U
	80	6/17/99	ORIG	0.0048	0.002 U	0.002 U	0.002 U	0.005 U	0.002 U	0.002 U	0.002 U	0.02 U	0.016	0.005 U
OW3	40	6/15/99	ORIG	0.08	0.0073	0.0025	0.002 U	0.014	0.002 U	0.002 U	0.002 U	0.02 U	0.005 U	0.005 U
	50	6/15/99	ORIG	0.0029	0.002 U	0.002 U	0.002 U	0.005 U	0.002 U	0.002 U	0.002 U	0.02 U	0.005 U	0.005 U
	75	6/15/99	ORIG	0.079	0.011	0.0024	0.002 U	0.09	0.002 U	0.002 U	0.002 U	0.02 U	0.066	0.026
H-1	55	1/31/96	ORIG	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.51 B	1 U	0.5 U
	69	1/31/96	ORIG	3.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
H-2	79	1/30/96	ORIG	0.0098	0.0056	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.078	0.013
H-4	57	1/30/96	ORIG	11	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
	67	1/30/96	ORIG	22	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
	75	1/30/96	ORIG	9.3	4.2	3.1	0.5 U	1.3	0.5 U	5	2	4.1	1 U	0.5 U
	110	1/30/96	ORIG	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3	15	2 U	1 U
SB-1	3	12/12/95	ORIG	0.01	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.01 U	0.005 U
	6.5	12/12/95	ORIG	0.017	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.01 U	0.005 U
SB-2	1.8	12/11/95	ORIG	0.036	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.01 U	0.005 U
	6.5	12/11/95	ORIG	0.0091	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.01 U	0.005 U

Table 4-3
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Soil Analytical Results

Borehole ID	Sample Depth (ft)	Sample Date	Sample Type	PCE	TCE	1,1,1-TCA	1,1,2-TCA	1,1-DCE	trans-1,3-DCP	1,2-DCA	CFM	MCL	Freon 113	Freon 11
SB-3	1.7	12/12/95	ORIG	0.098	0.026	0.005 U	0.005 U	0.0072	0.005 U	0.005 U	0.005 U	0.005 U	0.0072	0.005 U
	6.6	12/12/95	ORIG	0.069	0.012	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.0085	0.005 U
SB-4	1.6	12/11/95	ORIG	1.3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	6.6	12/11/95	ORIG	0.057	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.01 U	0.005 U
SB-5	1.8	12/11/95	ORIG	0.68	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	6.5	12/11/95	ORIG	0.032	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.01 U	0.005 U
SB-6	2.1	12/12/95	ORIG	1.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	6.5	12/12/95	ORIG	0.11	0.0076	0.0078	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.01 U	0.005 U
SB-7	1.7	12/11/95	ORIG	1.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	6.6	12/11/95	ORIG	0.11	0.005 U	0.011	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.01 U	0.005 U
SB-8	2.1	12/12/95	ORIG	1.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	6.6	12/12/95	ORIG	0.79	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
SB-9	1.8	12/13/95	ORIG	1300	98	970	50 U	60	50 U	50 U	50 U	59	420	160
	5.9	12/13/95	ORIG	1100	140	1200	50 U	50 U	50 U	50 U	50 U	100	590	220
SB-10	2.2	12/14/95	ORIG	6.6	0.5 U	1.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	6.5	12/14/95	ORIG	4.1	0.5 U	0.74	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
SB-11	1.8	12/14/95	ORIG	99	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	20 U	10 U
	6.5	12/14/95	ORIG	260	30 U	30 U	30 U	30 U	30 U	30 U	30 U	30 U	50 U	30 U
SB-12	1.7	12/11/95	ORIG	7.1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	6.5	12/11/95	ORIG	1.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U

Table 4-3
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Soil Analytical Results

Borehole ID	Sample Depth (ft)	Sample Date	Sample Type	PCE	TCE	1,1,1-TCA	1,1,2-TCA	1,1-DCE	trans-1,3-DCP	1,2-DCA	CFM	MCL	Freon 113	Freon 11
SB-13	1.8	12/12/95	ORIG	1.1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U
	6.7	12/12/95	ORIG	0.13	0.0069	0.0081	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.01 U	0.005 U
SB-14	1.8	12/11/95	ORIG	0.039	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.01 U	0.005 U
	6.6	12/11/95	ORIG	0.041	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.01 U	0.005 U
SB-15	1.7	12/11/95	ORIG	0.033	0.028	0.0082	0.005 U	0.036	0.005 U	0.005 U	0.005 U	0.005 U	0.057	0.018
	6.7	12/11/95	ORIG	*0.005 U*	*0.005 U*	*0.005 U*	*0.005 U*	*0.005 U*	*0.005 U*	*0.005 U*	*0.005 U*	*0.005 U*	*0.01 U*	*0.005 U*

Notes:

Concentrations are reported in milligrams per kilogram (mg/kg).
Only chlorinated compounds detected in one or more soil samples are reported.
Samples analyzed by EPA Method 8260B or EPA Method 8240.

U = Not detected at a concentration greater than the reporting limit shown.
B = Possible laboratory contamination.

Sample Type:
DUP = Duplicate sample
ORIG = Original sample

PCE = Tetrachloroethene; TCE = Trichloroethene; TCA = Trichloroethane; DCE = Dichloroethene; DCA = Dichloroethane; DCP = Dichloropropene; CFM = Chloroform; MCL = Methylene chloride; Freon 113 = 1,1,2-Trichloro-1,2,2-trifluoroethane; and Freon 11 = Trichlorofluoromethane.

Table 4-4
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Soil Analytical Results

Borehole ID	Sample Depth	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene	Total Xylenes	Acetone	THF
PIT-0.5	0.5	9/12/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
PIT-5.0	5	9/12/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
SUMP-0.5	0.5	9/12/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
SUMP-5	5	9/12/96	ORIG	1 U	1 U	1 U			2 U	34	
B-4	5	5/23/96	ORIG	50 U	50 U	50 U			200 U	1000 U	
	10	5/23/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	15	5/23/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	20	5/23/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	30	5/23/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	45	5/23/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	55	5/23/96	ORIG	3 U	3 U	3 U			10 U	50 U	
	65	5/23/96	ORIG	1 U	1 U	1 U			4 U	20 U	
	70	5/23/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	75	5/23/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
C-1	15	1/30/96	ORIG	0.03 U	0.03 U	0.03 U			0.1 U	0.5 U	
	30	1/30/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	45	1/30/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
C-2	15	1/30/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	30	1/30/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	45	1/30/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	52.5	1/30/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
C-3	15	2/1/96	ORIG	0.005 U	0.005 U	0.01 U			0.02 U	0.1 U	
	30	2/1/96	ORIG	0.03 U	0.03 U	0.03 U			0.1	0.3 U	
	45	2/1/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	60	2/1/96	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
	75	2/1/96	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
C-7	15	2/1/96	ORIG	0.5 U	0.3 U	0.5 U			2 U	10 U	
C-7A	15	2/1/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	30	2/1/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	45	2/1/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	52	2/1/96	ORIG	1 U	1 U	1 U			4 U	20 U	
OW1b	35	6/16/99	ORIG	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.1 U	
	45	6/16/99	ORIG	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.1 U	

Table 4-4
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Soil Analytical Results

Borehole ID	Sample Depth	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene	Total Xylenes	Acetone	THF
OW1b	55	6/16/99	ORIG	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.1 U	
	60	6/16/99	ORIG	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.01 U	0.22
	65	6/16/99	ORIG	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U		0.5 U	
	70	6/16/99	ORIG	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U		0.95	
	75	6/16/99	ORIG	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U		0.5 U	
	80	6/16/99	ORIG	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.1 U	
	90	6/16/99	ORIG	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.1 U	
	100	6/18/99	ORIG	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.01 U	
	110	6/18/99	ORIG	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.01 U	
	120	6/18/99	ORIG	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.01 U	
OW2	45	6/17/99	ORIG	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.01 U	
	60	6/17/99	ORIG	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.01 U	
	80	6/17/99	ORIG	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.01 U	
OW3	40	6/15/99	ORIG	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.01 U	
	50	6/15/99	ORIG	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.01 U	
	75	6/15/99	ORIG	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.01 U	
H-1	55	1/31/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	69	1/31/96	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
H-2	79	1/30/96	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
H-4	57	1/30/96	ORIG	3 U	3 U	3 U			10 U	30 U	
	67	1/30/96	ORIG	3 U	3 U	3 U			10 U	50 U	
	75	1/30/96	ORIG	0.5 U	14	0.5 U			2	10 U	
	110	1/30/96	ORIG	1 U	1 U	1 U			4	20 U	
SB-1	3	12/12/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
	6.5	12/12/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
SB-2	1.8	12/11/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
	6.5	12/11/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
SB-3	1.7	12/12/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
	6.6	12/12/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
SB-4	1.6	12/11/95	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	6.6	12/11/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
SB-5	1.8	12/11/95	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	6.5	12/11/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	

Table 4-4
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Soil Analytical Results

Borehole ID	Sample Depth	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene	Total Xylenes	Acetone	THF
SB-6	2.1	12/12/95	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	6.5	12/12/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
SB-7	1.7	12/11/95	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	6.6	12/11/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
SB-8	2.1	12/12/95	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	6.6	12/12/95	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
SB-9	1.8	12/13/95	ORIG	50 U	50 U	50 U			200 U	1000 U	
	5.9	12/13/95	ORIG	50 U	62	50 U			200 U	1000 U	
SB-10	2.2	12/14/95	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	6.5	12/14/95	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
SB-11	1.8	12/14/95	ORIG	10 U	10 U	10 U			40 U	200 U	
	6.5	12/14/95	ORIG	30 U	30 U	30 U			100 U	500 U	
SB-12	1.7	12/11/95	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	6.5	12/11/95	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
SB-13	1.8	12/12/95	ORIG	0.5 U	0.5 U	0.5 U			2 U	10 U	
	6.7	12/12/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
SB-14	1.8	12/11/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
	6.6	12/11/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
SB-15	1.7	12/11/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	
	6.7	12/11/95	ORIG	0.005 U	0.005 U	0.005 U			0.02 U	0.1 U	

Notes:

THF = Tetrahydrafuran

Concentrations are reported in milligrams per kilogram (mg/kg).

U = Not detected at a concentration greater than the reporting limit shown.
Only analytes detected in one or more soil samples are listed.
If result is blank, then analyte was not reported.
Samples analyzed by EPA Method 8260B or EPA Method 8240.

Sample Type:
DUP = Duplicate sample
ORIG = Original sample

Table 4-5
Omega Chemical Superfund Site
Semi-Volatile Organic Compounds (SVOCs) Analytical Summary
Soil Analytical Results

Borehole ID	Sample Depth (ft)	Sample Date	2-Methyl Naphthalene	Benzo (a) Anthracene	Benzyl Alcohol	Benzo (a) Pyrene	Benzo (b) Fluoranthene	Benzo (ghi) Perylene	Bis (2-ethylhexyl) Phthalate	Chrysene	Di-n-octyl Phthalate	Fluor-anthene	Isophorone	Phen-anthrene	Pyrene
SB-1	3	12/12/95	200 U	200 U	400 U	200 U	200 U	200 U	400 U	200 U	200 U	200 U	200 U	200 U	200 U
SB-2	1.8	12/11/95	200 U	200 U	400 U	200 U	200 U	200 U	400 U	200 U	200 U	200 U	200 U	200 U	200 U
SB-3	1.7	12/12/95	200 U	200 U	400 U	200 U	200 U	200 U	400 U	200 U	200 U	200 U	200 U	200 U	200 U
SB-4	1.6	12/11/95	200 U	200 U	400 U	200 U	200 U	200 U	400 U	200 U	200 U	200 U	200 U	200 U	200 U
SB-5	1.8	12/11/95	200 U	200 U	400 U	200 U	200 U	200 U	400 U	200 U	200 U	200 U	200 U	200 U	200 U
SB-6	2.1	12/12/95	200 U	200 U	400 U	200 U	200 U	200 U	400 U	200 U	200 U	200 U	200 U	200 U	200 U
SB-7	1.7	12/11/95	200 U	200 U	400 U	200 U	200 U	200 U	400 U	200 U	200 U	200 U	200 U	200 U	200 U
SB-8	2.1	12/12/95	200 U	200 U	400 U	200 U	200 U	200 U	400 U	200 U	200 U	200 U	540	200 U	200 U
SB-9	1.8	12/13/95	1000 U	1000 U	5200	1000 U	1000 U	1000 U	3600	1000 U	1000 U	1000 U	9900	1000 U	1000 U
	5.9	12/13/95	1000 U	1000 U	22000	1000 U	1000 U	1000 U	3500	1000 U	1000 U	1000 U	6500	1000 U	1000 U
SB-10	2.2	12/14/95	200 U	200 U	400 U	200 U	200 U	200 U	400 U	200 U	200 U	200 U	200 U	200 U	200 U
SB-11	1.8	12/14/95	200 U	200 U	400 U	200 U	200 U	200 U	3400	200 U	240	200 U	200 U	200 U	200 U
	6.5	12/14/95	400 U	400 U	800 U	400 U	400 U	400 U	4300	400 U	400 U	400 U	400 U	400 U	400 U
SB-12	1.7	12/11/95	200 U	200 U	400 U	200 U	200 U	200 U	3200	200 U	200 U	200 U	200 U	200 U	200 U
	6.5	12/11/95	200 U	200 U	400 U	200 U	200 U	200 U	400 U	200 U	200 U	200 U	200 U	200 U	200 U
SB-13	1.8	12/12/95	200 U	200 U	400 U	200 U	200 U	200 U	400 U	200 U	200 U	200 U	200 U	200 U	200 U
SB-14	1.8	12/11/95	200 U	200 U	400 U	200 U	200 U	200 U	400 U	200 U	200 U	200 U	200 U	200 U	200 U
SB-15	1.7	12/11/95	540	2400	800 U	1600	910	490	800 U	6000	400 U	660	400 U	5000	3100

Notes:
Concentrations are reported in milligrams per kilogram (mg/kg).
Only analytes detected in one or more soil samples are reported.
Samples analyzed by EPA Method 8270.

U = *Not detected at a concentration greater than the reporting limit shown.*

Table 4-6
Omega Chemical Superfund Site
PCB and Pesticide Analytical Summary
Soil Analytical Results

Borehole ID	Sample Depth	Sample Date	PCB-1254	4,4'-DDD	4,4'-DDE	4,4'-DDT
SB-1	3	12/12/95	30 U	0.7 U	0.7 U	0.7 U
SB-2	1.8	12/11/95	30 U	0.7 U	0.7 U	0.7 U
SB-3	1.7	12/12/95	30 U	0.7 U	0.7 U	0.7 U
SB-4	1.6	12/11/95	30 U	0.7 U	1.2	2.2
SB-5	1.8	12/11/95	30 U	0.7 U	0.7 U	1.7
SB-6	2.1	12/12/95	30 U	0.7 U	0.7 U	0.7 U
SB-7	1.7	12/11/95	30 U	0.7 U	0.7 U	0.7 U
SB-8	2.1	12/12/95	30 U	0.7 U	0.7 U	0.7 U
SB-9	1.8	12/13/95	30 U	0.7 U	0.7 U	0.7 U
	5.9	12/13/95	30 U	0.7 U	0.7 U	0.7 U
SB-10	2.2	12/14/95	30 U	0.7 U	0.7 U	0.7 U
SB-11	1.8	12/14/95	30 U	0.7 U	0.7 U	0.7 U
	6.5	12/14/95	60 U	2 U	2 U	2 U
SB-12	1.7	12/11/95	210 E	0.7 U	0.7 U	0.7 U
	6.5	12/11/95	52	0.7 U	0.7 U	0.7 U
SB-13	1.8	12/12/95	30 U	0.7 U	0.7 U	0.7 U
SB-14	1.8	12/11/95	30 U	0.7 U	0.7 U	4.8
SB-15	1.7	12/11/95	30 U	1.5 E	5.4 E	13 E

Notes:

Concentrations are reported in micrograms per kilogram (ug/kg).

U = Not detected at a concentration greater than the reporting limit shown.
E = Result may be biased high; high surrogate spike recovery.
Only analytes detected in one or more soil samples are listed.
Samples analyzed by EPA Method 8080.

Table 4-7
Omega Chemical Superfund Site
Metals Analytical Summary
Soil Analytical Results

Boring ID	Sample Depth (ft)	Arsenic	Antimony	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Mercury	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
SB-1	3.0	3.2	10 U	140	0.57	0.5 U	20	10	63	0.1 U	11	3.5	30	0.4 U	1 U	7 U	48	110
SB-2	1.8	3.7	10 U	130	0.52	0.5 U	16	8.8	27	0.1 U	15	3.2	24	0.4 U	1 U	7 U	45	73
SB-3	1.7	3.4	10 U	150	0.6	0.5 U	22	9	29	0.1 U	14	2.7	27	0.4 U	1 U	7 U	58	65
SB-4	1.6	4	10 U	120	0.39	0.5 U	18	8.6	22	0.1 U	20	2.2	18	0.4 U	1 U	7 U	44	76
SB-5	1.8	4.7	10 U	150	0.67	0.5 U	28	9.9	27	0.1 U	16	3.7	30	0.4 U	1 U	7 U	71	68
SB-6	2.1	4.5	10 U	160	0.57	0.5 U	19	9.3	32	0.1 U	21	3.7	26	0.4 U	1 U	7 U	52	68
SB-7	1.7	4.2	10 U	75	0.29	0.5 U	12	4.7	17	0.1 U	33	1.5	12	0.4 U	1 U	7 U	32	42
SB-8	2.1	3.1	10 U	150	0.56	0.5 U	15	8.2	43	0.1 U	8.5	3.6	25	0.4 U	1 U	7 U	46	65
SB-9	1.8	1.8	10 U	38	0.39	0.5 U	8.2	5.2	38	0.1 U	10	1 U	7.5	0.4 U	1 U	7 U	31	42
	5.9	0.81	10 U	28	0.29	0.5 U	5.6	4 U	38	0.1 U	5 U	1 U	4.9	0.4 U	1 U	7 U	21	34
SB-10	2.2	1.4	10 U	140	0.5	0.5 U	11	8.9	56	0.1 U	33	3.4	23	0.4 U	1 U	7 U	40	92
SB-11	1.8	2.1	10 U	160	0.46	0.5 U	12	6.3	99	0.1 U	110	2.1	18	0.4 U	1 U	7 U	37	89
	6.5	2.2	10 U	110	0.41	0.5 U	11	7.3	45	0.1 U	8.5	2.5	20	0.4 U	1 U	7 U	32	63
SB-12	1.7	9	13	180	0.75	0.5 U	210	16	150	0.54	890	4.1	55	0.4 U	1 U	7 U	56	350
	6.5	3.1	10 U	160	0.57	0.5 U	60	7.3	28	0.1 U	13	3.5	26	0.4 U	1 U	7 U	67	67
SB-13	1.8	3.5	18	230	0.57	0.5 U	21	8.6	34	0.1 U	33	4.2	25	0.4 U	1 U	7 U	56	69
SB-14	1.8	6.6	10 U	150	0.55	0.5 U	43	9.5	29	0.1 U	54	3.1	31	0.4 U	1 U	7 U	53	89
SB-15	1.7	3.2	10 U	170	0.55	0.5 U	24	9	24	0.1 U	41	2.9	26	0.4 U	1 U	7 U	62	81

Notes:

Concentrations are reported in milligrams per kilogram (mg/kg).

U = Not detected at a concentration greater than the reporting limit shown.

Table 4-8
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Groundwater Analytical Results

Well Number	Sample Date	Sample Type	PCE	TCE	1,1,1-TCA	1,1,2-TCA	PCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCA	1,2-DCA	1,2-DCB	CBN	CTC	CFM	MCL	Freon 113	Freon 11	VC
B-4	5/24/96	ORIG	81000	2800	7700	1000 U		6600	1000 U	1000 U	1000 U	1100	1000 U	1000 U	1000 U	1800	13000	3100	1000 U	1000 U
OW1	6/6/96	ORIG	81000	3400	12000	500 U		3600	500 U	500 U	500 U	2600	500 U	500 U	500 U	3200	15000	1400	990	500 U
	4/30/97	ORIG	81000	3400				550	500 U		500 U					3200	15000	1400	990	
	7/2/99	ORIG	23000	1300	2100	4.6	2.6	1200	5.4	160	86	120	0.97	2	3.6	400	110	1300	550	2.1
OW1b	7/2/99	ORIG	180 R	11	7.4	0.5 U	1 U	11	0.5 U	0.65	2.4	8.8	0.5 U	1 U	0.5 U	6.6	10 U	12	2.9	0.5 U
	7/2/99	DUP	300	14	7.8	0.5 U	1 U	13	0.5 U	0.78	2.8	10	0.5 U	1 U	0.5 U	7.7	10 U	12	3	0.5 U
OW2	7/2/99	ORIG	1300	240	8.5	2 U	4 U	680	2 U	2 U	2.8	2 U	2 U	4 U	2 U	4 U	40 U	2600	610	2 U
OW3	7/2/99	ORIG	670	170	28	2 U	4 U	1200	2 U	2 U	2 U	2 U	2 U	4 U	2 U	4 U	40 U	800	410	2 U
H-1	1/31/96	ORIG	3200	670	260	50 U		1700	50 U	61	50 U	50 U	50 U	50 U	50 U	50 U	100 U	6300	2700	50 U
	1/31/96	DUP	3200	600	240	50 U		1100	50 U	50	50 U	50 U	50 U	50 U	130 U	50 U	250 U	3600	2100	130 U
H-2	1/30/96	ORIG	470	250	10 U	10 U		100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	20 U	2000	430	10 U
H-3	1/31/96	ORIG	540	160	50 U	50 U		550	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	100 U	2700	880	50 U
H-4-GW-A	2/1/96	ORIG	32000	1700	3200	500 U		3600	500 U	500 U	500 U	1100	500 U	500 U	500 U	1400	3100	5500	2900	500 U
H-6	4/30/97	ORIG	33000	6300				6900	500 U		500 U					22000	110000	7500	4300	
H-6-70	7/15/96	ORIG	33000	6300	2200	500 U	500 U	6900	500 U	500 U	500 U	2500	500 U	500 U	500 U	22000	110000	7500	4300	500 U
	7/15/96	DUP	29000 H	4600 H	2000 UH	2000 UH		6100 H	2000 UH	2000 UH	2000 UH	2300 H		2000 UH	5000 UH	23000 H	150000 H	0000 UH	5000 UH	5000 UH
H-6-86	7/15/96	ORIG	3100	840	290	30 U	30 U	1400	30 U	30 U	30 U	91	30 U	30 U	30 U	1300	800	5800	2500	30 U
H-7	7/17/96	ORIG	330	100	3.6	3 U	3 U	450	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	10 U	1400	400	3 U
H-8	7/16/96	ORIG	9.5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	700	620	5 U
H-9	7/16/96	ORIG	2200	180	270	30 U	30 U	3400	30 U	30 U	30 U	30 U	30 U	30 U	30 U	30 U	100 U	2100	630	30 U

Table 4-8
Omega Chemical Superfund Site
Chlorinated VOCs Analytical Summary
Groundwater Analytical Results

Well Number	Sample Date	Sample Type	PCE	TCE	1,1,1-TCA	1,1,2-TCA	PCA	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCA	1,2-DCA	1,2-DCB	CBN	CTC	CFM	MCL	Freon 113	Freon 11	VC
H-9	4/30/97	ORIG	2200	180				3400	30 U		30 U					30 U	100 U	2100	630	
H-10	7/16/96	ORIG	11	5 U	5 U	5 U	5 U	280	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	760	700	5 U
H-11	7/17/96	ORIG	920	120	380	30 U	30 U	2400	30 U	30 U	30 U	30 U	30 U	30 U	30 U	30 U	100 U	1500	590	30 U
H-12-80	7/19/96	ORIG	92	40	10 U	10 U		99	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	20 U	1200	250	10 U
	7/19/96	DUP	89	38	10 U	10 U		93	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	20 U	1100	230	10 U
H-13	7/19/96	ORIG	1100	170	180	30 U	30 U	1700	30 U	30 U	30 U	30 U	30 U	30 U	30 U	78	100 U	2600	960	30 U
	4/30/97	ORIG	1100	170				1700	30 U		30 U					78	100 U	2600	960	
H-14	4/30/97	ORIG	95	520				34	8.2		5 U					5 U	10 U	260	49	
H-15	4/30/97	ORIG	200	40				140	1		1 U					40	2 U	220	57	
H-16	4/30/97	ORIG	71	3.6				2.4	4.5		1 U					1 U	2 U	2 U	1 U	
H-17	4/30/97	ORIG	580	45				53	133.8		1 U					1 U	2 U	2 U	1 U	
	4/30/97	DUP	500	40				34	123.8		1 U					1 U	2 U	2 U	1 U	

Notes:

Concentrations are reported in micrograms per liter (ug/l).
Only chlorinated compounds detected in one or more groundwater samples are reported.
Samples analyzed by EPA Methods 502.2, 8240 or 8260.
If blank, analyte was either not reported or not analyzed.

U = Not detected at a concentration greater than the reporting limit shown.
H = Estimated result; sample analyzed after holding time.
R = Result not usable based on data validation.

Sample Type:
ORIG = Original sample
DUP = Duplicate sample

PCE = Tetrachloroethene; TCE = Trichloroethene; TCA = Trichloroethane; PCA = 1,1,1,2-Tetrachloroethane; DCE = Dichloroethene; DCA = Dichloroethane; DCB = Dichlorobenzene; CBN = Chlorobenzene; CTC = Carbon tetrachloride; CFM = Chloroform; MCL = Methylene chloride; Freon 113 = 1,1,2-Trichloro-1,2,2-trifluoroethane; Freon 11 = Trichlorofluoromethane; and VC = Vinyl chloride.

Table 4-9
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Groundwater Analytical Results

Well ID	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene	Total Xylenes	Acetone
B-4	5/24/96	ORIG	1000 U	1000 U	1000 U			3000 U	20000 U
OW1	6/6/96	ORIG	500 U	500 U	500 U			2000 U	10000 U
	4/30/97	ORIG							10000 U
	7/2/99	ORIG	10	14	1.5	1.5	3		10 U
OW1b	7/2/99	ORIG	0.5 U	0.5 U	1 U	1 U	1 U		10 U
	7/2/99	DUP	0.5 U	0.5 U	1 U	1 U	1 U		10 U
OW2	7/2/99	ORIG	2 U	2 U	4 U	4 U	4 U		40 U
OW3	7/2/99	ORIG	2 U	2 U	4 U	4 U	4 U		40 U
H-1	1/31/96	ORIG	50 U	50 U	50 U			200 U	1000 U
	1/31/96	DUP	50 U	50 U	50 U			50 U	250 U
H-2	1/30/96	ORIG	10 U	10 U	10 U			30 U	200 U
H-3	1/31/96	ORIG	50 U	50 U	50 U			200 U	1000 U
H-4-GW-A	2/1/96	ORIG	500 U	500 U	500 U			2000 U	10000 U
H-6	4/30/97	ORIG							26000
H-6-70	7/15/96	ORIG	500 U	2900	500 U	1000 U	500 U		26000
	7/15/96	DUP	2000 UH	2200 H	2000 UH			2000 UH	30000 H
H-6-86	7/15/96	ORIG	30 U	57	30 U	50 U	30 U		500 U
H-7	7/17/96	ORIG	3 U	3 U	3 U	5 U	3 U		50 U
H-8	7/16/96	ORIG	5 U	5 U	5 U	10 U	5 U		100 U
H-9	7/16/96	ORIG	30 U	30 U	30 U	50 U	30 U		500 U
	4/30/97	ORIG							500 U
H-10	7/16/96	ORIG	75	5 U	5 U	10 U	5 U		100 U
H-11	7/17/96	ORIG	30 U	30 U	30 U	50 U	30 U		500 U
H-12-80	7/19/96	ORIG	10 U	10 U	10 U			30 U	200 U
	7/19/96	DUP	10 U	10 U	10 U			30 U	200 U
H-13	7/19/96	ORIG	30 U	30 U	30 U	50 U	30 U		500 U
	4/30/97	ORIG							500 U
H-14	4/30/97	ORIG							100 U
H-15	4/30/97	ORIG							20 U
H-16	4/30/97	ORIG							20 U

Table 4-9
Omega Chemical Superfund Site
Aromatic and Other VOCs Analytical Summary
Groundwater Analytical Results

Well ID	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene	Total Xylenes	Acetone
H-17	4/30/97	ORIG							20 U
	4/30/97	DUP							20 U

Notes:

Concentrations are reported in micrograms per liter (ug/l).

Only analytes detected in one or more groundwater samples are listed.
U = Not detected at a concentration greater than the reporting limit shown.
H = Estimated result; sample analyzed after holding time.
Samples analyzed by EPA Methods 502.2, 8240 or 8260.
If blank, analyte was either not reported or not analyzed.

Sample Type:
DUP = Duplicate sample
ORIG = Original sample

Table 4-10
Omega Chemical Superfund Site
Metals and Cations Analytical Summary
Groundwater Analytical Results

Well ID	Sample Date	Aluminum	Calcium	Copper	Iron	Magnesium	Manganese	Potassium	Sodium	Zinc
OW1	6/6/96	0.1	1100	0.02	0.04	130	0.66	14	340	0.01

Notes:

Concentrations are reported in milligrams per liter (mg/l).

U = Not detected at a concentration greater than the reporting limit shown.
Samples analyzed by EPA Method 6010.

Table 4-11
Omega Chemical Superfund Site
Anions and General Mineral Analytical Summary
Groundwater Analytical Results

Well ID	Sample Date	Bicarbonate Alkalinity	Carbonate Alkalinity	Chloride	Conductivity	Nitrate (as NO3)	Nitrite (as NO2)	Sulfate	TDS	pH
OW1	6/6/96	130	10	2500	6900	36	5	140	5900	7.4

Notes:

Concentrations are reported in milligrams per liter (mg/l).

U = Not detected at a concentration greater than the reporting limit shown.

Section 5
Evaluation of Data Gaps

Detailed review of the findings and conclusions of prior investigations at the Site has revealed several areas where data gaps exist and the collection of additional data is recommended in order to assist with subsequent investigation and remedial work.

Additional data collection requirements in support of the interim groundwater remedy will commence in the near future, with the installation of additional monitoring wells along Washington Boulevard and further down-gradient. Once these wells have been installed and sampled, a Phase 1a SAP Addendum will be prepared to identify any additional data that will be required to design and implement the interim groundwater remedy.

With respect to on-site soils, an RI/FS Work Plan will be prepared which describes the scope of subsurface investigations, including soil vapor, subsurface soils, and groundwater. Based on this Data Summary Report, pertinent data gaps are summarized briefly below. The precise locations for further on-site investigations will be specified in the RI/FS Work Plan

Soil Vapor

Existing soil vapor data show that the highest VOCs detected from prior soil vapor surveys is PCE, particularly adjacent to the loading dock, and sumps, thereof, along the western boundary of the site. The distribution of the PCE vapors in shallow soils is shown in Appendix A, Figure 13. Furthermore, on-site groundwater data (see Appendix A, Figure 17) demonstrate that PCE is the dominant VOC in that media as well. During the RI/FS, it will be important to determine whether (a) PCE vapors are migrating in a manner which would pose an unacceptable risk to public health, such that mitigation is required, and (b) whether additional source control is appropriate and feasible to reduce the scope of groundwater action(s). Therefore, the RI/FS Work Plan should specify further investigation in the vicinity of the loading dock; such investigation should initially include multiple-depth soil vapor probes and, potentially, confirmatory soil matrix sampling where elevated vapor readings are encountered. Sampling in this area should include Freons and a full suite of VOCs, to ensure that all chemicals of potential concern (COPCs) are identified, particularly those that may be risk "drivers", such as vinyl chloride.

Limited additional characterization of the occurrence of Freon 113 vapors may also be appropriate in the RI/FS, to the extent that such vapors would pose an unacceptable risk or would impact the design and implementation of the groundwater remedy. As shown on Appendix A, Figure 14, Freon 113, apparently derived from the Cal Air property adjacent to the site to the northwest, has impacted the site. As noted above, additional occurrence of Freon 113 has been observed in the loading dock area; this will be covered with the multi-depth soil vapor survey.

There are no other apparent data gaps with respect to soil gas at this time. The soil vapor survey performed during prior work (see Appendix A, Figures 13 and 14 for the distribution of survey locations) provided an adequate grid to identify any other potential source areas.

Subsurface Soils

As illustrated in Tables 4-3 through 4-7, a considerable amount of soil analytical data currently exists. The majority of the samples were collected from relatively shallow depths (less than 10 feet bgs). The aerial photographic review performed in 2000 identified possible spill areas and chemical handling areas which have not been investigated to date. Therefore, additional subsurface soil sampling for VOC analysis will be required in several on-Site areas (e.g., possible historical fluid discharge points adjacent to the southeastern and southwestern corners of the office building, and several areas in the southern portion of the southern yard where soil piles and depressions were observed in historical aerial photos). The HBCGs developed in the risk assessment will be used to guide the collection of the additional soils analytical data. Also, it may be prudent to use soil vapor survey points to initially investigate these areas, followed by confirmatory soil matrix sampling, as required.

Review of Site lithologic logs indicated that soils underlying the Site consisted predominately of fine-grained materials, with two notable exceptions. At boring and well locations in the western yard (BMW-1 and C-3), a coarser-grained sandy unit was encountered below the water table. At location BMW-1, the material was observed in the interval from 73 feet bgs to the bottom of the boring at 110 feet bgs (a minimum thickness of 37 feet). A boring location C-3 located approximately 45 feet northeast of BMW-1, coarser-grained material was encountered at the bottom of the boring at a depth of 75 feet bgs. This coarser-grained unit may indicate a zone of preferential contaminant transport in the lower portion of the vadose zone and in the saturated zone. Therefore, the extent of this sandy unit in the western portion of the Site should be evaluated.

In summary, therefore, existing data indicate that three areas of the site may require additional characterization of the subsurface soil matrix - (a) where elevated soil vapors are detected, particularly in the loading dock area, (b) where aerial photos indicate that additional unknown sources may exist, and (c) in portions of the western yard where more permeable sediments may exist within or near the capillary zone. Such additional data collection would be appropriate during the RI/FS if either unacceptable risks are posed, or if further source control would increase the efficiency of the groundwater action.

Groundwater

No additional data are currently required relative to on-site groundwater. However, depending on the results of soil matrix sampling in the western area – near borings BMW-1 and C-3 – some limited additional groundwater sampling may be appropriate. Hydropunch location H-1 exhibited elevated PCE concentrations with respect to upgradient locations H-2 and H-12. If additional soil characterization in the western area shows both permeable transport pathways and the potential for other contaminant sources, then additional Geoprobe or Hydropunch sampling may be warranted.

Section 6
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Appendix A
Historical Figures, Tables and Executive Summary

PHASE II CLOSE OUT REPORT

OMEGA CHEMICAL SITE PRP ORGANIZED GROUP

WHITTIER, CALIFORNIA

ES EXECUTIVE SUMMARY

The soil and groundwater assessment was conducted at the Omega Chemical Site, Whittier, California, to fulfill the requirements of paragraphs 21 (h) and (i) of Administrative Order 95-15, issued by the U.S. Environmental Protection Agency (EPA) on May 9, 1995, as amended (the Order). Paragraphs 21 (h-i) state:

> *"h. Conduct surface and subsurface soil sampling and groundwater sampling to determine the nature and extent of contamination.*
>
> *i. Dispose, stabilize or treat grossly contaminated concrete, asphalt and/or soils found at or near the surface at the direction of the OSC."*

All of the work described in this Phase II Close Out Report (Report) has been performed in accordance with the Workplan dated October 27, 1995, prepared by England & Associates and Hargis + Associates, Inc. (England/Hargis), and approved by EPA on November 8, 1995, as supplemented and amended by nine EPA-approved Technical Memoranda and supplements.

The Order was performed in two phases. Phase I, which involved the removal of drums, containers, and debris, and decontamination of the surface of the site, was completed in September 1995. A final multi-volume closure report was submitted to EPA on October 13, 1995 (the "Phase I Action"). Phase II commenced on November 13, 1995, and is completed with the submittal of this Report.

This Report *summarizes* the results of the Phase II Investigation. Detailed information regarding specific activities, data summary tables, and figures are provided in the individual Technical Memoranda Nos. 1-9, previously submitted to EPA, but also attached to this Report as Appendix A.

Background

The Omega Chemical Site PRP Organized Group (OPOG) understands that the Omega site operated as a spent solvent and refrigerant recycling and treatment facility handling primarily chlorinated hydrocarbons and chlorofluorocarbons (EPA, 1995b). Drums and bulk loads of waste solvents and chemicals from various industrial activities were processed to form commercial products which were returned to generators or sold in the marketplace. Chemical, thermal and physical treatment processes were reportedly used to recycle and reuse the waste materials. Wastes generated from these treatment activities included still bottoms, aqueous fractions and non-recoverable solvents.

Several assessments of subsurface conditions at the site were conducted between 1985 and 1988, under the oversight of the Los Angeles County Departments of Health Services (LACDHS), Public Works (LACDPW), and Fire (LACFD). These investigations included sampling of soil gas, soil and groundwater beneath the site (Crandall, 1985; Leighton, 1987; ERT, 1988; ENSR, 1988). The results of these activities are summarized below:

Subsurface soils were sampled in the former tank farm area near the western corner of the site in 1985 at the direction of LACDHS (Crandall, 1985). Volatile organic compounds (VOCs) detected in soil samples collected from five shallow soil borings ranged up to 1,000 parts per million (ppm), primarily at depths shallower than 3.5 feet below land surface (bls).

In 1987, at the direction of LACDPW and under the supervision of LACFD, Leighton & Associates documented the removal of a 500-gallon underground storage tank (UST) (Leighton, 1987). Hydrocarbons and 1,1,1-trichloroethane (TCA) were detected in sludge from the tank. Two soil samples collected beneath the tank contained total VOC concentrations of 8.5 ppm at 10 to 12 feet bls. Hydrocarbons were detected at concentrations of up to approximately 300 ppm, and acetone was detected at concentrations of up to approximately 14 ppm.

A soil gas survey was performed for Omega Chemical at the site in 1988 (Environmental Research & Technology [ERT], 1988a). It is unclear whether this work was performed at the direction of a public agency. Areas of elevated VOCs were detected across most of the site, except for the northeastern corner. VOCs were reported in a qualitative format without actual concentration values.

Soil samples collected from five borings in a second study in 1988 were found by ENSR (previously ERT) to contain tetrachloroethylene (PCE) at concentrations ranging from 0.005 milligrams per kilogram (mg/kg) to 0.854 mg/kg (ENSR, 1988). Freon 113 was detected at concentrations of up to 0.880 mg/kg, while trichloroethylene (TCE) was detected at concentrations up to 0.350 mg/kg. The VOC detected at the highest concentration was methylene chloride, found at a maximum concentration of 2.65 mg/kg. Other VOCs were detected less frequently and/or at lower concentrations. Again, it is unclear whether ENSR's work was performed at the direction of a public agency.

During this study by ENSR, groundwater monitoring well BMW-1 was installed in June 1988, with a screened interval of 90-100 feet bls. The initial groundwater sample from BMW-1 contained Freon 113 at a concentration of 5,240 micrograms per liter ($\mu g/\ell$). Other VOCs, including TCA, trichlorofluoromethane (Freon 11), 1,1-dichloroethene (1,1-DCE), and PCE, were detected at lower concentrations.

Phase II Investigation

Paragraph 21 (h) of the Order requires that OPOG "conduct surface and subsurface soil sampling and groundwater sampling to determine the nature and extent of contamination." This provision of the Order has been completed, as described below.

After the Phase I Action, Phase II was initiated by OPOG to fulfill the requirements of the Order through evaluation of soil gas, soil and groundwater. OPOG also proceeded to identify any materials which would be considered "grossly contaminated" under Paragraph 21(i) of the Order. The scope of work required under Phase II was executed as a phased investigation, utilizing Technical Memoranda following each major field activity to summarize the results of that activity for EPA's and OPOG's reference and review, to present revised recommendations for the next activity, and to obtain EPA approval of proposed field work. In the course of the Phase II field investigations, nine Technical Memoranda and supplements were prepared and approved by EPA.

Phase II field activities commenced on November 13, 1995, and were concluded on September 12, 1996. Technical Memorandum No. 9 was submitted and verbally approved by EPA on September 27, 1996. This Technical Memorandum outlined procedures for sampling, analysis, and appropriate disposal of material generated during the field investigation. Drum removal and disposal will be immediately completed once sampling and analysis results have been reviewed to assess the appropriate disposal procedures as outlined in Technical Memorandum No. 9. The following bullet items summarize the results of the Phase II investigation and its conclusions:

Geology and Hydrogeology

- The site is underlain by low permeability, silty and clayey soils of the Upper Pleistocene Lakewood Formation to a depth of at least 120 feet. These materials probably represent the Bellflower aquiclude.

- No transmissive aquifer was found immediately beneath the site, but the uppermost aquifer in the site vicinity is probably the Gage aquifer of the Lakewood Formation. Groundwater directly beneath the site occurs approximately 70 feet bls within low permeability silt and clay, and is apparently unconfined. A coarse-grained sandy layer, probably representing the Gage aquifer, was encountered southwest of the site along Putnam Street, but was not detected beneath the site.

- Comparison of aquifer test data indicate that hydraulic conductivity is as much as two to three orders of magnitude lower in the fined-grained materials beneath the Omega site than in the coarser materials found beneath the down-gradient former Chevron site, which is located approximately 1,500 feet southwest of the site.

- Based on levels of Total Dissolved Solids (TDS) exceeding 3,000 milligrams per liter (mg/ℓ), groundwater beneath the site is not suitable, or potentially suitable for municipal or domestic water supply, according to the definitions of the State Water Resources Control Board (SWRCB, 1988; Resolution No. 88-63).

- Groundwater flow at the site is generally toward the southwest with a hydraulic gradient beneath the site of 0.0125. The gradient appears to be steepest in the tight, fine-grained materials in the immediate vicinity of the site, and appears to flatten to 0.0015 in the coarser sediments southwest of the site.

- The nearest active down-gradient supply wells are located more than one mile from the site. Only three wells within two miles have been active since 1990 (2S/11W-32J4, 2S/11W-30Q5, and 2S/11W-30R3). Well screen information for two of these wells (2S/11W-32J4 and 2S/11W-30R3) showed screened intervals from 200 or more feet bls to 900 feet bls. Based on regional cross sections prepared by the Department of Water Resources, at least two aquicludes appear to be present between the shallowest aquifer and the top of the well screen in these wells.

Nature of Contamination

- Principal contaminants in subsurface soils and groundwater at the site are VOCs: mainly PCE and related compounds, TCA, and freons. Other VOCs detected at the down-gradient site boundary and off-site include the chlorinated methane compounds: methylene chloride and chloroform (dichloromethane and trichloromethane), as well as acetone and toluene.

- In on-site soil gas samples, the VOCs detected were primarily Freon 113 and Freon 11, PCE, and TCA.

- In shallow vadose zone soil (less than 12 feet bls), the predominant VOC was PCE. Concentrations of PCE in soil ranged from 0.01 mg/kg to 510 mg/kg. Much lower concentrations of TCA were found in a few samples, and traces of Freon 113 were detected in two samples. In the deeper vadose zone, low concentrations of TCE, 1,1-DCE, 1,2-dichloroethane (1,2-DCA), and Freon 11 were found as well as PCE, TCA, and Freon 113. The highest deep soil concentration of PCE was 56 mg/kg at 55 feet bls in boring B-4, located between the loading dock and the southwest property boundary.

- Based on field work conducted by OPOG, no indications of dense non-aqueous phase liquids (DNAPL) were identified in vadose zone soil.

- Material contained within the loading dock sump contained the highest concentrations of VOCs found anywhere on the site (the term "loading dock sump" refers to a square, soil-filled and concrete-covered sump identified on the loading dock during the Phase II soil gas survey). Total VOCs exceeded 3,000 mg/kg in each of two analyzed samples. PCE had the highest concentrations in the soil, followed by TCA, Freon 113, Freon 11, TCE, methylene chloride, 1,1-DCE, and toluene.

- All loading dock sump material was considered "grossly contaminated" Paragraph 21(i) material, and was excavated, transported to an EPA-approved off-site disposal facility, incinerated, and disposed. Manifests documenting the transportation and disposal of the loading dock sump materials are included in Appendix F. Certification of destruction will be forwarded upon completion.

- No other exposed or "near-surface" grossly contaminated materials were identified during this investigation.

Extent of Contamination

- Freon 113 and Freon 11 vapors appear to extend from the adjacent Cal-Air site across the center of the Omega site in the 6 foot and 12 foot bls soil gas samples Soil gas concentrations dropped by one to more than two orders of magnitude at sample depths greater than 12 feet. Based on Omega's operating logs and visual observation by England/Hargis personnel and EPA's On-Scene Coordinator (OSC), Cal-Air is known to have handled these materials.

- Soil gas samples showed the highest PCE and TCA concentrations near the south end of the loading dock, and decreased rapidly with distance from that area.

- PCE was the most prevalent VOC in shallow soil samples, with every collected soil sample containing detectable PCE. As with the soil gas, the highest PCE concentrations were centered around the south end of the loading dock. Apart from the loading dock sump materials (discussed above), PCE concentrations in the shallow soil samples were relatively low.

- Detectable concentrations of PCE in the soil extend toward the water table.

- Very low levels of VOCs, including PCE, 1,2-DCA, TCA and acetone were detected in four soil samples collected at depths of 0.5 and 5 feet beneath the loading dock sump and "Pit" (the term "Pit" refers to the uncovered and empty rectangular sump located on the loading dock). The highest detected concentrations for PCE, 1,2-DCA, TCA and acetone in this area were 11, 1.6, 0.95, and 34 mg/kg, respectively.

- PCE was found in the on-site and off-site groundwater samples, at concentrations up to 86,000 $\mu g/\ell$. This is about two-thirds the solubility of pure PCE in water and indicates that PCE may be present nearby in a DNAPL phase that is in contact with groundwater.

- Sampling indicates that the dissolved-phase PCE plume extends from the site over 1,700 feet southwest. Predictive analysis of groundwater and plume movement indicates a total estimated plume length of approximately 3,000 to 3,150 feet. Additional sources may be responsible for the PCE plume at this distance from the site.

- Off-site samples taken at the water table and below show a rapid drop in PCE concentration with increasing depth. A shallow groundwater sample collected at a depth of 70 feet from H-6 (approximately 200 feet southwest of the site) contained 33,000 $\mu g/\ell$ of PCE, while a sample collected 16 feet deeper was an order of magnitude lower, containing only 3,100 $\mu g/\ell$.

- Freon 113 and Freon 11 were found in all but the shallowest sample from the on-site CPT/HydroPunch sample H-4. Other VOCs found in each of the on-site samples include TCE and 1,1-DCE.

- Methylene chloride, chloroform, TCA, and toluene were found only in some groundwater samples collected along the down-gradient boundary of the site, and in some off-site samples collected down-gradient of Terra Pave.

- The highest concentrations of methylene chloride and chloroform were found off-site, down-gradient of the Terra Pave site, in sample H-6 at 110,000 $\mu g/\ell$ and 22,000 $\mu g/\ell$, respectively. The methylene chloride concentration is approximately 1% of its solubility, which indicates that there may be nearby residual or free-phase DNAPL within or above the saturated zone. These concentrations are about an order of magnitude higher than the highest on-site concentrations of these compounds, raising the possibility that there is a source of these compounds at the Terra Pave site.

- Acetone was detected at 26,000 $\mu g/\ell$ in H-6. This is the only groundwater sample in this investigation that contained detectable acetone. This further suggests the potential for a source of contamination on the Terra Pave property.

- Sample H-6 was the only off-site sample found to contain toluene. Its concentration of 2,900 $\mu g/\ell$ was 5 times that of the only detected on-site concentration, from sample H-4 near the property boundary between Omega and Terra Pave.

- The methylene chloride, chloroform, acetone and toluene appear to be from a different, down-gradient source (such as Terra Pave) than the PCE for the following reasons:

  1. Methylene chloride, chloroform, acetone, and toluene are found at much higher concentrations at off-site location H-6 (beyond the Terra Pave property) than in any on-site sample.
  2. Methylene chloride in H-6 is higher than the highest PCE concentration found in any of the samples.
  3. Methylene chloride appears not to have spread as far down-gradient as PCE, even though its concentration is much higher.

- The nearest down-gradient water supply well (2S/11W-29E5) is located nearly one mile away, and is no longer operating (Al Bragg - LACDHS, personal communication, September 23, 1996.)

- The nearest water supply well downgradient of the site for which VOC data are available, 30-R3, is located approximately 7,000 feet west-southwest of the site. TCE and chloroform were detected in 30-R3 in 1994 at concentrations below their respective Maximum Contaminant Levels (MCLs). The well's screened interval begins at 200 feet bls.

- High-volume pumping from down-gradient extraction well 30-R3 may be influencing regional groundwater flow, and may serve to draw dissolved contaminants toward the well if there is communication between the Gage aquifer and the producing aquifers.

- VOCs detected in regional well 30-R3 may not originate at the Omega site. Other potential sources of VOCs to groundwater in the site vicinity, including Cal-Air and Terra Pave, have not been evaluated. VOCs detected in 30-R3 may originate from these other potential sources, or may represent downgradient commingling of distinct plumes. Other nearby facilities, including Leggett & Platt (located cross-gradient to the Omega site) and Jones Chevrolet, have documented the presence of VOCs in groundwater beneath their sites.

- Unspecified down-gradient extraction wells owned by the Mutual Water Owners Association of Los Nietos have historically contained detectable concentrations of PCE and TCE. The nearest Los Nietos well (30-Q5) well is located about 8,500 feet down-gradient of the Omega site. This well is situated on the far side of well 30-R3, which pumps at a very high rate. These facts make it unlikely that the detected VOCs in the Los Nietos wells can be attributed to the Omega site.

- Existing governmental controls embodied in the Federal and California Safe Drinking Water Act programs prevent public exposure to VOC contaminated groundwater. Extraction of groundwater for use as drinking water is strictly regulated. Under the Safe Drinking Water Act, water purveyors are required to treat water with VOC contaminants to below MCLs prior to delivery. In conjunction with the Central Basin Watermaster (which controls the rate and volume of groundwater extraction), the Central and West Basin Water Replenishment District performs basin-wide monitoring to meet the requirements of the California Department of Health Services (DOHS) and the LACDHS for water supplies distributed for domestic use as set forth in California Title 22.

- These restrictions apply to limit potential exposure to VOCs in groundwater at and near the Omega site. Additionally, public exposure through direct contact (i.e., dermal, ingestion, inhalation) at the site can be eliminated since the Phase I work has been completed, the concrete cover precludes further contact, and the site is secured and no longer includes an operating business.

Grossly Contaminated Materials

Paragraph 21, Section i of the Order required that OPOG "dispose, stabilize or treat grossly contaminated concrete, asphalt and/or soils found at or near the surface . . ." This provision of the Order has been completed, as described below:

- No grossly contaminated concrete or asphalt was identified at the site.

- The only grossly contaminated near-surface soil identified at the site was contained within the loading dock sump, which was identified during Phase I inspection by its broken and cracked concrete cover. Approximately 8 yds^3 of material from this sump was removed on September 11, 1996, and transported to Waste Management, Inc.'s Port Arthur, Texas facility (an EPA-approved Off-site Rule facility). A copy of the manifest documenting the transportation and disposal of the sump material is included in Appendix F.

- No other grossly contaminated near-surface materials were identified.

Conclusions

The potential, if any, for imminent or substantial endangerment arising from current conditions at the site is very low. Grossly contaminated near-surface soil has been removed. Soils impacted by VOCs at the site are located beneath concrete and are not exposed at the surface. No complete human exposure pathway to groundwater impacted by VOCs originating at the site has been established, and the existing regulatory framework and institutional controls prevents one from becoming established.

Based upon the above, contamination of soil and groundwater by VOCs originating at the site has therefore been defined to the extent required under the Order. In conjunction with the Phase I Action, the scope and results of this investigation have completed the requirements of Administrative Order No. 95-15.

Table 4-1
Omega Chemical Superfund Site
Depth to Water and Groundwater Elevation Data

Well No.	CA Coordinates Zone 7, NAD27 (feet)	UTM Coordinates Zone 11, NAD83 (meters)	Reference Point Elevation (feet MSL)	Depth to Water (feet below Ref. Point)	Groundwater Elevation (feet MSL)
OW1	N 4101351.3 E 4274702.0	N 3759242.1 E 403554.4	210.30	71.42	138.88
OW1b	N 4101331.7 E 4274666.4	N 3759236.3 E 403543.4	204.98	72.58	132.40
OW2	N 4101362.0 E 4274396.2	N 3759246.6 E 403461.2	200.10	63.83	136.27
OW3	N 4101113.0 E 4274538.0	N 3759170.1 E 403503.4	198.33	59.80	136.53

TABLE 2
Results of Geotechnical Analyses
Deep Soil Boring B-4

Sample ID	Depth (feet)	Moisture Content (%)	Dry Density (pcf)	Grain Size Distribut. (G:S:F)	Specific Gravity	TOC (%)	Effective Porosity (%)	Hydraulic Conductivity (cm/sec)
B-4-5	5	24.9	93.1					
B-4-10	10	15.1	102.3					
B-4-15	15	20.3	105.4			0.38		
B-4-20	20	16.3	100.0	9:53:38	2.64	0.19	16.2	3.6×10^{-6}
B-4-30	30	21.9	101.0					
B-4-55	55	21.3	103.6	0:11:89	2.65	0.25	15.4	1.3×10^{-8}
B-4-65	65	23.6	102.9					
B-4-70	70	20.0	108.9	0:15:85				
B-4-75	75	25.0	100.0	0:18:82	2.71	0.12	14.3	3.4×10^{-8}

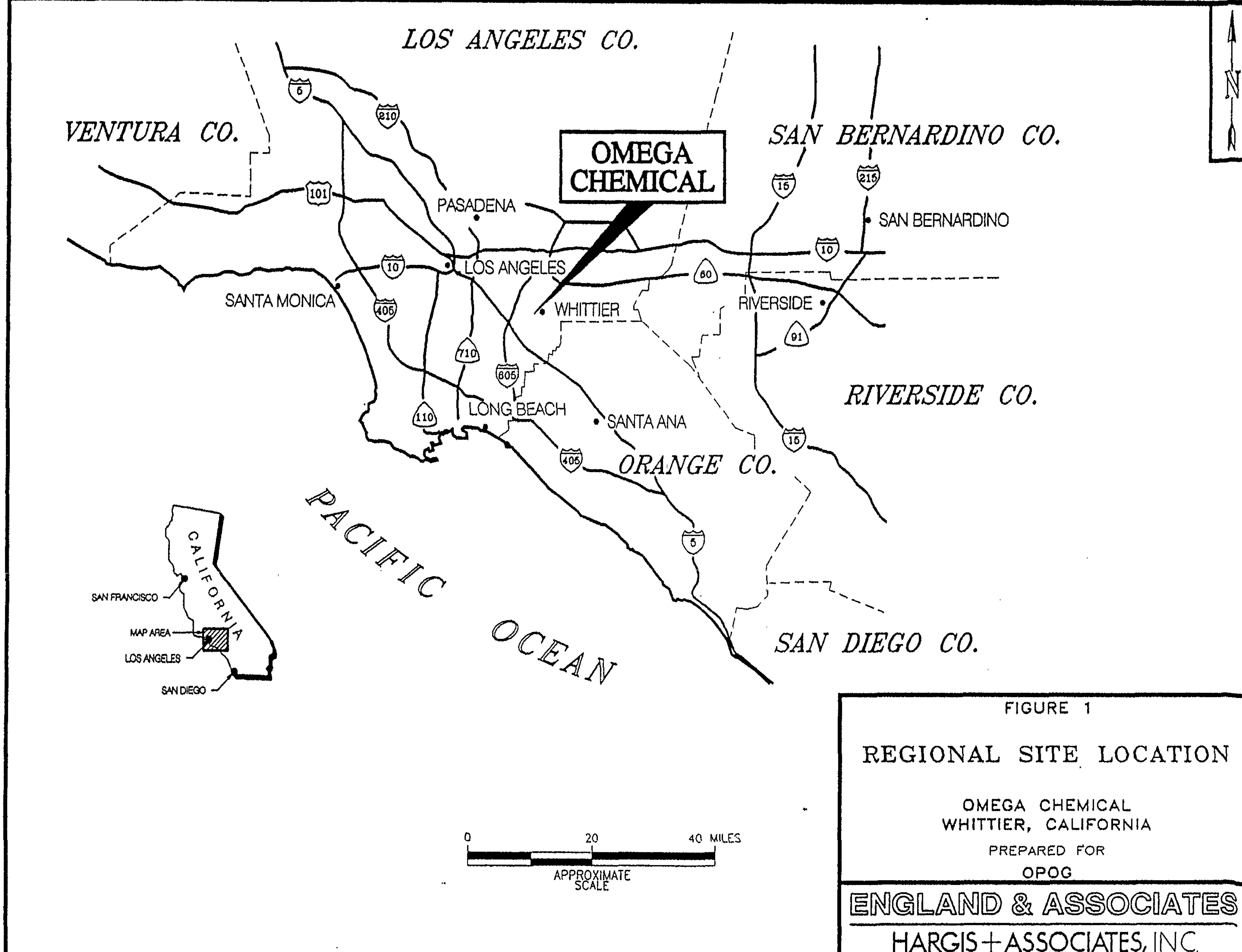


FIGURE 1

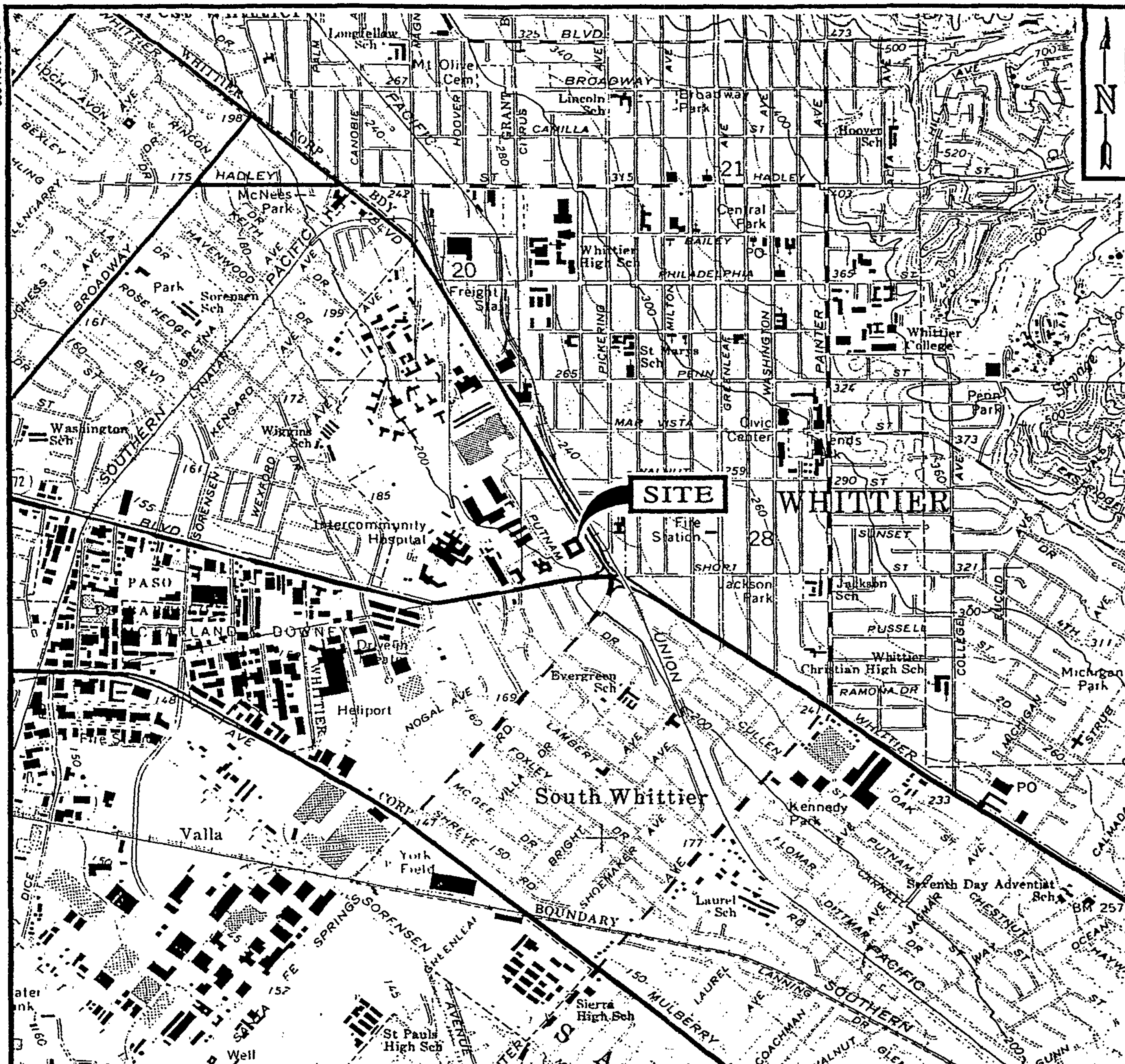
REGIONAL SITE LOCATION

OMEGA CHEMICAL
WHITTIER, CALIFORNIA

PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS + ASSOCIATES, INC.



0 2000 4000 FEET

APPROXIMATE SCALE

REFERENCE:
7.5 MINUTE U.S.G.S. TOPOGRAPHIC MAP OF WHITTIER, CALIFORNIA
DATED: 1965
PHOTOREVISED: 1981

FIGURE 2

SITE LOCATION MAP

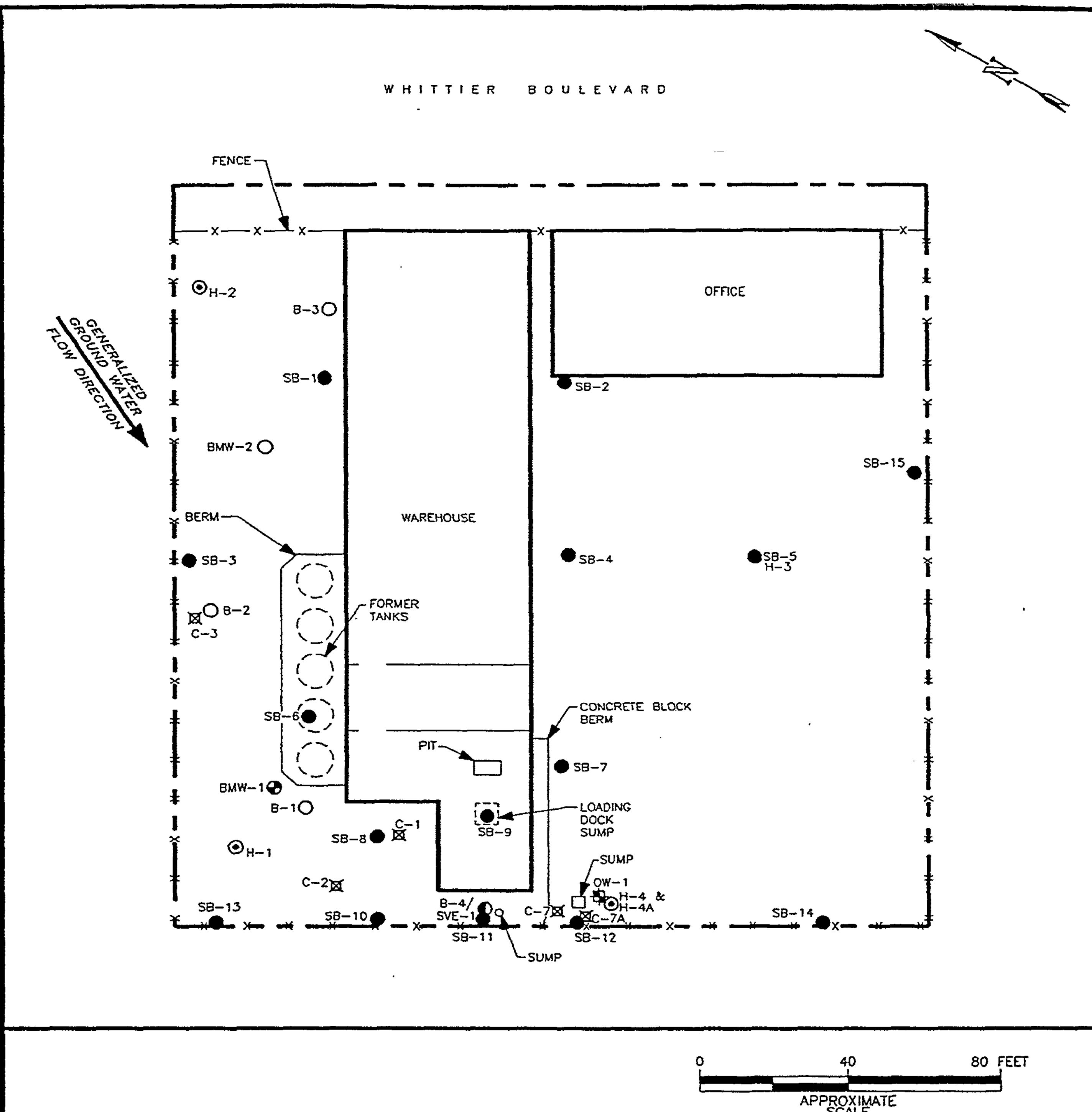
OMEGA CHEMICAL
WHITTIER, CALIFORNIA

PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS+ASSOCIATES, INC.

399-A\4020\003\09/30/96



EXPLANATION

B-2 ○	ENSR SOIL BORING
BMW-1	FORMER ENSR GROUNDWATER MONITORING WELL
H-4 ⊙	CPT LOCATION (ENGLAND & HARGIS, 1996)
C-7 ⊠	OTHER SOIL SAMPLING LOCATION (ENGLAND & HARGIS, 1996)
B-4/SVE-1 ◐	SOIL BORING/VAPOR EXTRACTION TEST WELL
OW-1	GROUNDWATER MONITORING WELL
SB-15 ●	SHALLOW SOIL SAMPLING LOCATION

NOTE:
LOCATIONS APPROXIMATE.

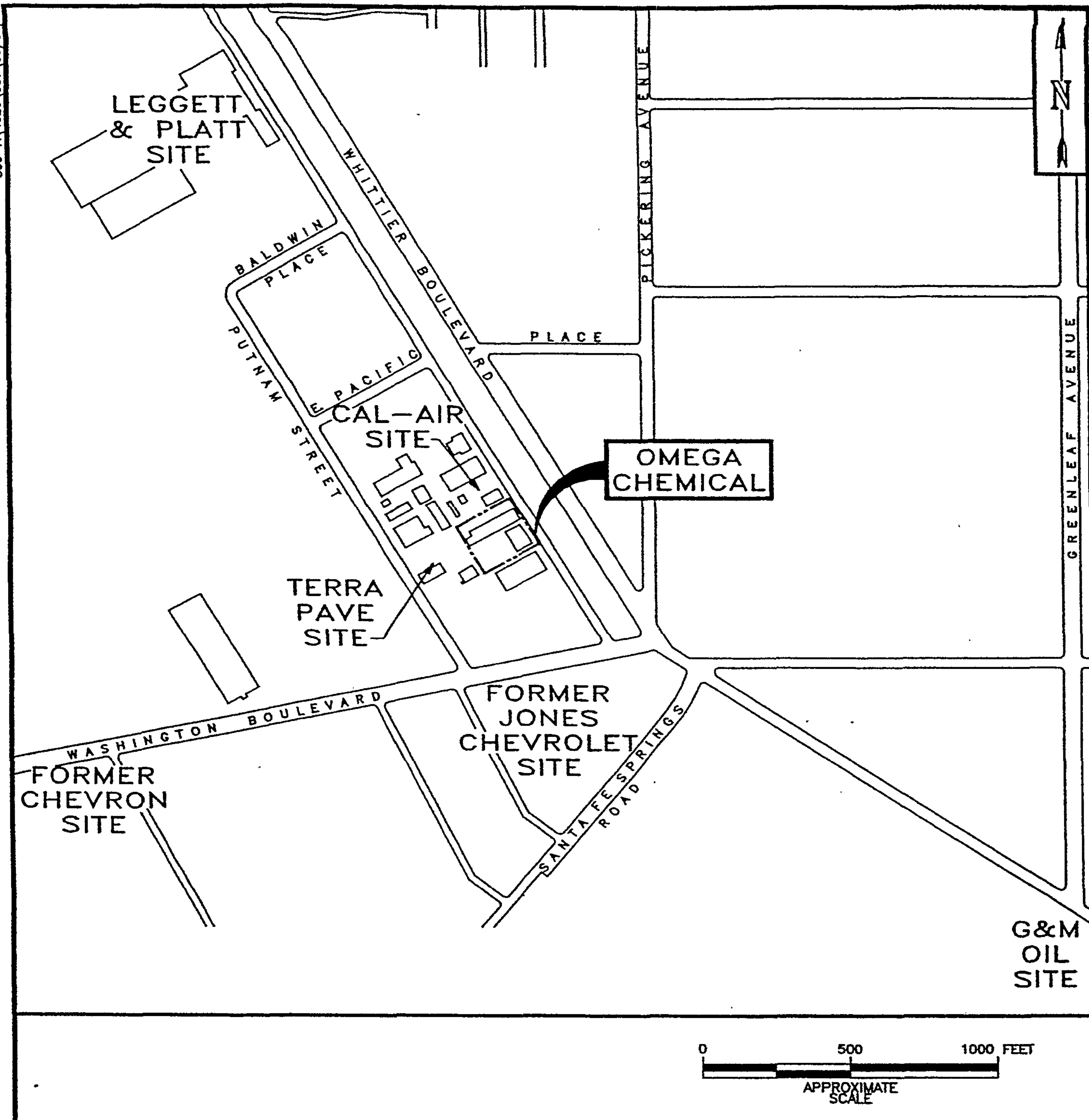
FIGURE 3

ON-SITE SAMPLING AND WELL LOCATIONS

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES
HARGIS+ASSOCIATES, INC.

399-A\4020\007\09/30/96



SOURCE:
CITY OF WHITTIER

FIGURE 4

NEARBY SITES

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS + ASSOCIATES, INC.

APPENDIX B

Summary of Regional Site Evaluation

This summary is based on the results of an evaluation of other sites within approximately one-half mile of Omega. Existing monitoring wells at other sites, briefly described in the table below, will be used to collect data in order to focus the course of investigation.

Site	Contaminants Detected in Groundwater (VOC Status)
Chevron Station No. 9-7441	Gasoline station: 1,500 ft SW of site: 12 monitoring wells installed. COMPOUNDS: TPH-Gas, BTEX compounds: No analysis of other VOCs.
Leggett & Platt	Furniture manufacturing facility: 2,000 ft NW of site: 11 wells installed. COMPOUNDS: Naphthalene, BTEX compounds, TPH-Diesel, TCE, PCE. Highest TCE detection: 1.8 $\mu g/\ell$ W-11 on 3-22-94 Highest PCE detection: 4.2 $\mu g/\ell$ W-3 on 3-22-94
G&M Oil Co.	Gasoline station: 2,300 ft SE of site: unknown number of monitoring wells installed (No groundwater data in RWQCB files). COMPOUNDS detected in soil samples were: TPH-Gasoline, TPH-Diesel, BTEX compounds, and Lead: No analysis of other VOCs.
Jones Chevrolet (Taylor Trust Property)	Former automobile dealership: 800 ft S of site: 15 monitoring wells installed. COMPOUNDS: TPH-Gasoline, BTEX compounds (including alkyl benzenes), dihydro methylindenes, MTBE, methylcyclohexane, methylcyclopentane, naphthalene, tetrahydronaphthalene, bromo- and chloro-trihalomethanes (THM), Freon 11, Freon 113, PCE, TCE, TCA. Highest PCE detection: 7.9 $\mu g/kg$ MW-12 on 2-3-94 Highest Freon 11 detection: 920 $\mu g/kg$ MW-10 on 9-9-94 Highest Freon 113 detection: 460 $\mu g/kg$ MW-10 on 2-3-94 Highest THM detection: 33.7 $\mu g/kg$ MW-9 on 9-9-94 Highest TCE detection: 2.2 $\mu g/kg$ MW-11 on 9-9-94 Highest TCA detection: 2.2 $\mu g/kg$ MW-4 on 9-9-94

3-8-96:APP-B.TM6

EXPLANATION

- ● ACTIVE WELL: NO PRODUCTION 1993-94/ 1994-95
- ◒ PRODUCING SUPPLY WELL 1993-94/1994-95

REFERENCE:
7.5 MINUTE U.S.G.S. TOPOGRAPHIC
MAP OF WHITTIER, CALIFORNIA
DATED: 1965
PHOTOREVISED: 1981

FIGURE 5

ACTIVE PRODUCTION WELLS

OMEGA CHEMICAL
WHITTIER, CALIFORNIA

PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS+ASSOCIATES, INC.

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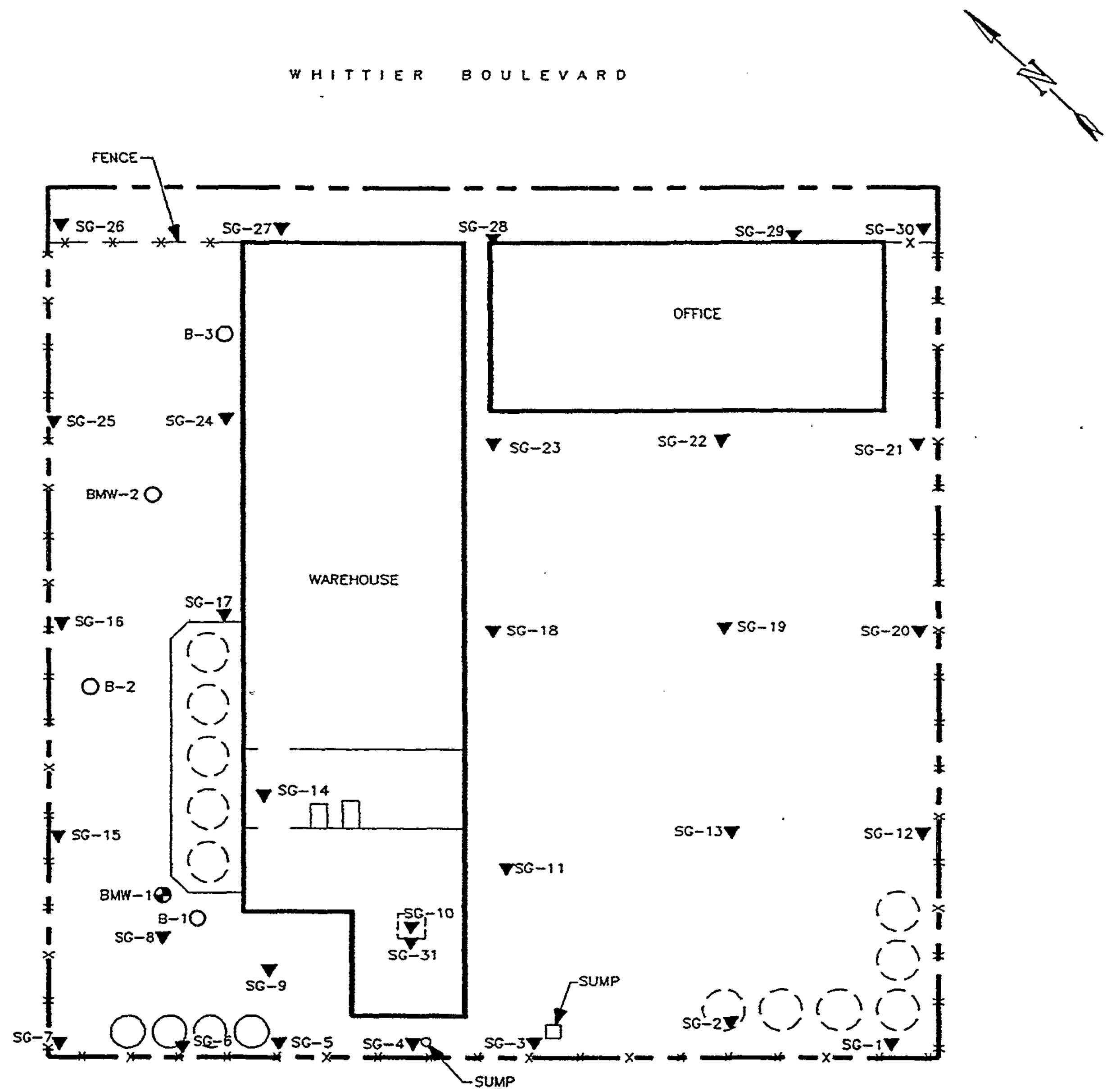

0 40 80 FEET

APPROXIMATE SCALE

EXPLANATION	
B-2 ○	ENSR SOIL BORING
BMW-1 ◐	ENSR GROUND WATER MONITORING WELL
SG-30 ▼	SOIL GAS SAMPLE POINT

FIGURE 6

SOIL GAS SAMPLING LOCATIONS

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS + ASSOCIATES, INC.

NOTE:
LOCATIONS APPROXIMATE.

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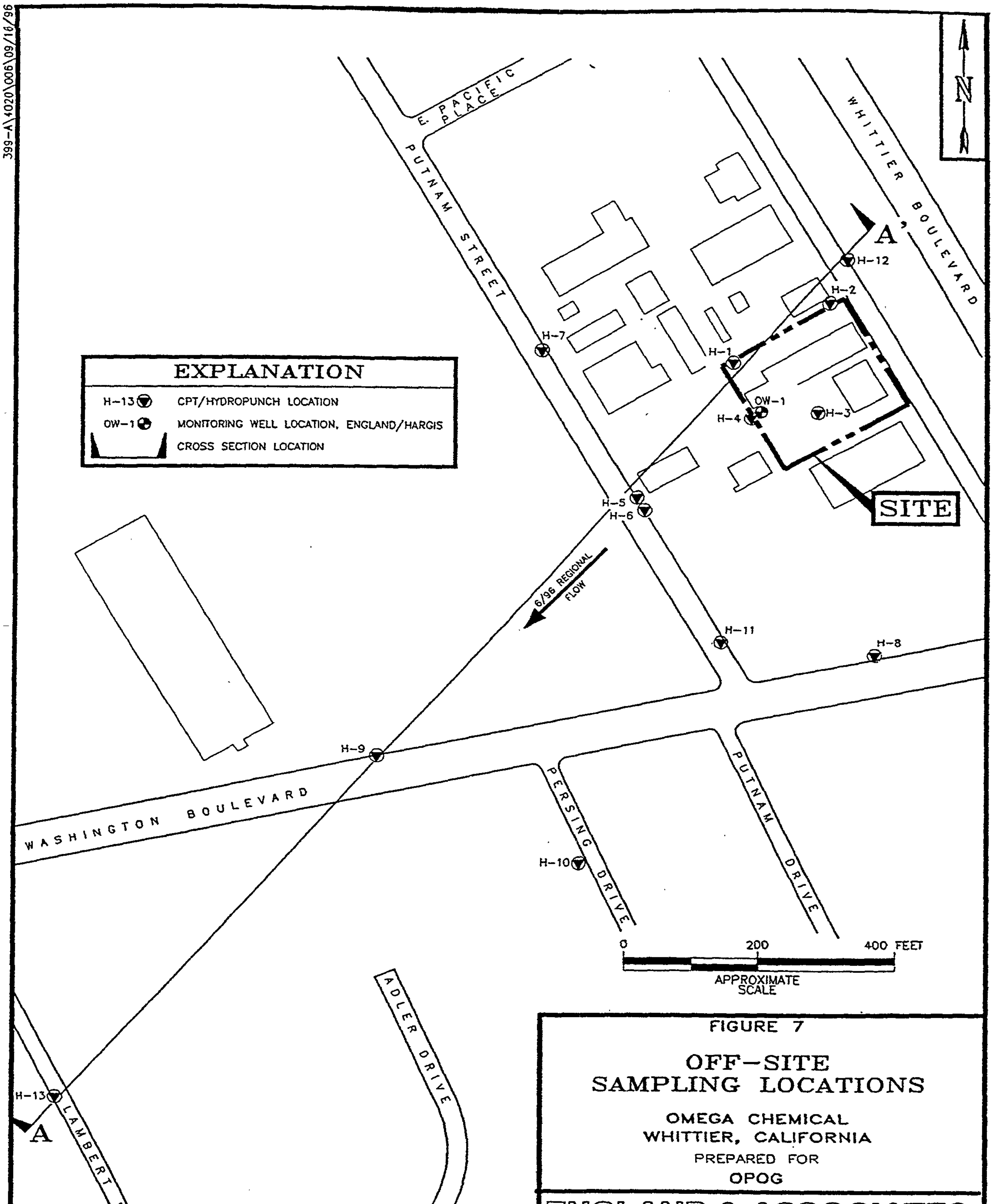


FIGURE 7

OFF-SITE SAMPLING LOCATIONS

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES
HARGIS+ASSOCIATES, INC.

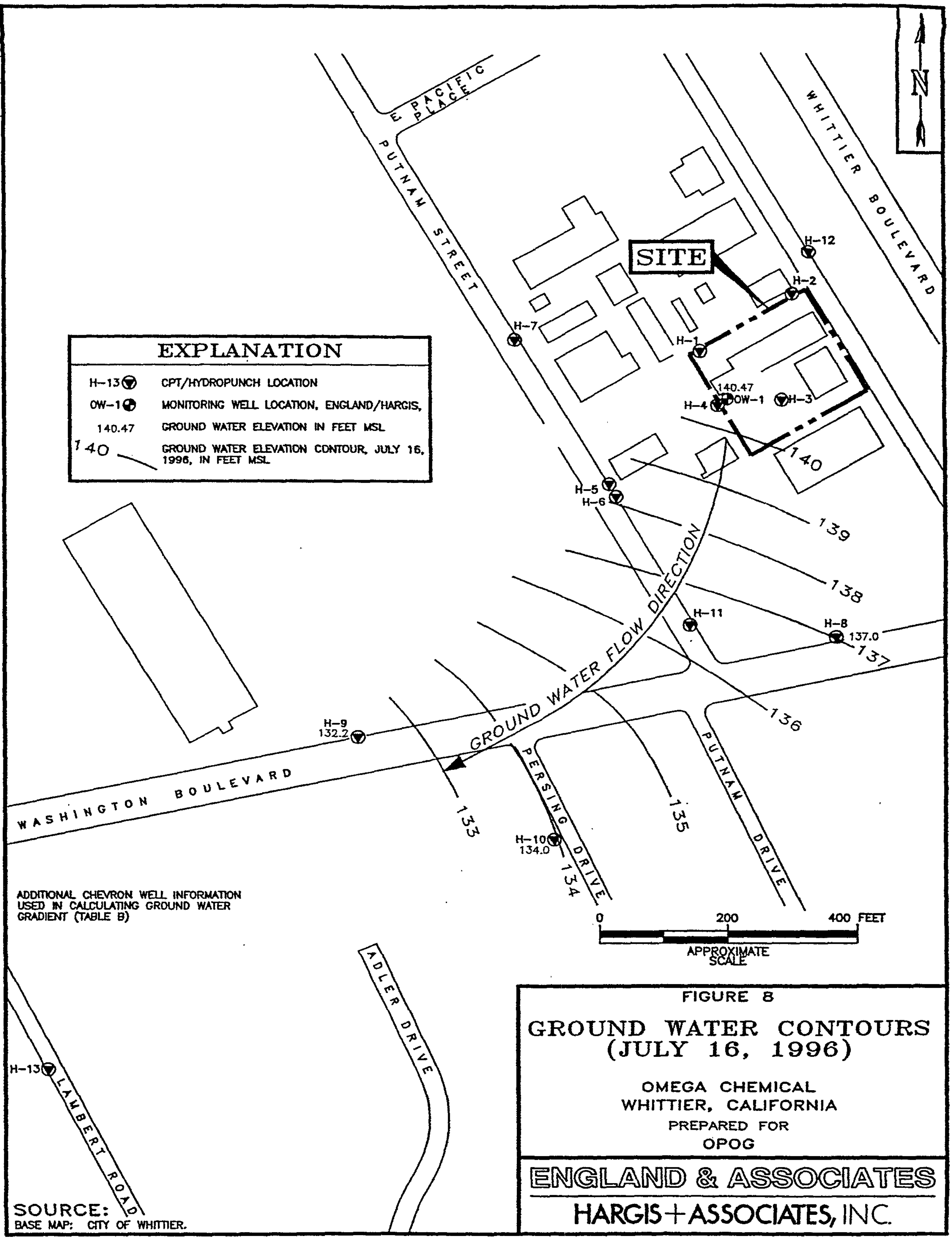
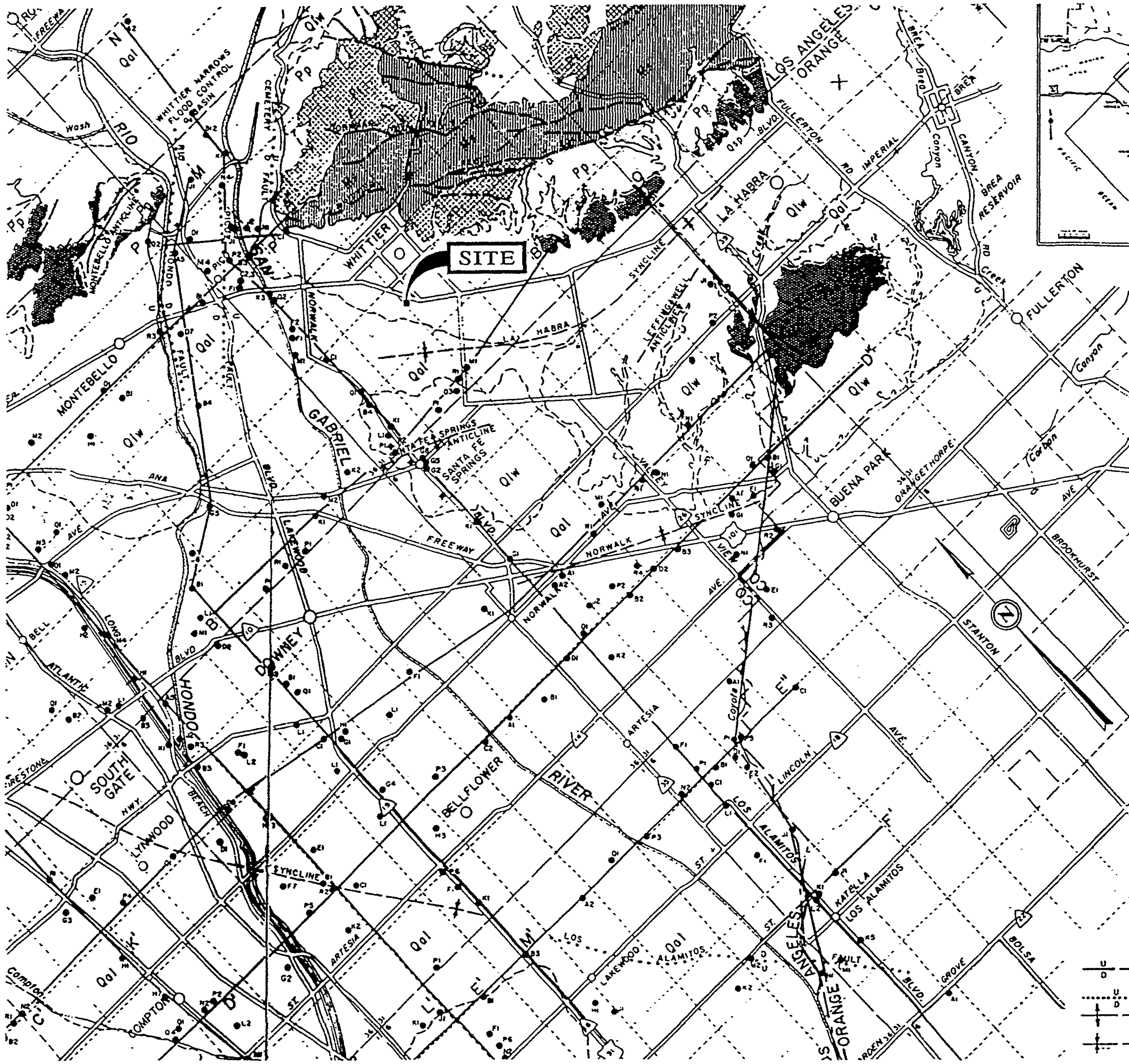


FIGURE 8

GROUND WATER CONTOURS (JULY 16, 1996)

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES
HARGIS+ASSOCIATES, INC.



LEGEND

SEDIMENTARY ROCKS

QUATERNARY

RECENT
- Qal — ALLUVIUM: GRAVEL, SAND, SILT, AND CLAY
- Qsr — ACTIVE DUNE SAND: WHITE OR GREYISH, WELL SORTED SAND

PLEISTOCENE, UPPER
- OLDER DUNE SAND: FINE TO MEDIUM SAND WITH SILT, AND GRAVEL LENSES
- Qlw — LAKEWOOD FORMATION (INCLUDES "TERRACE DEPOSITS," "PALOS VERDES SAND," AND "UNNAMED UPPER PLEISTOCENE DEPOSITS"): MARINE AND CONTINENTAL GRAVEL, SAND, SANDY SILT, SILT, AND CLAY WITH SHALE PEBBLES

PLEISTOCENE, LOWER
- SAN PEDRO FORMATION (INCLUDES "LA HABRA CONGLOMERATE" AND PART OF "SAUGUS FORMATION"): MARINE AND CONTINENTAL GRAVEL, SAND, SANDY SILT, SILT, AND CLAY
- Qsp-Pp — UNDIFFERENTIATED SAN PEDRO FORMATION AND/OR PICO FORMATION: MARINE, PARTIALLY CONSOLIDATED GRAVEL, SAND, SILT, AND CLAY

TERTIARY

PLIOCENE
- Pp — PICO FORMATION: MARINE SAND, SILT, AND CLAY INTERBEDDED WITH GRAVEL
- Pr — REPETTO FORMATION: MARINE SILTSTONE WITH LAYERS OF SANDSTONE AND CONGLOMERATE

MIOCENE
- Ms —
  - (SANTA MONICA MOUNTAINS) MODELO FORMATION: MARINE CONGLOMERATIC SANDSTONE, SANDSTONE, AND SHALE
  - TOPANGA FORMATION: MARINE CONGLOMERATE, SANDSTONE, AND SHALE
  - (PALOS VERDES HILLS) MONTEREY FORMATION: MUDSTONE, DIATOMITE, AND SHALE
  - (ELYSIAN HILLS, REPETTO HILLS, AND PUENTE HILLS) PUENTE FORMATION: MARINE SILTSTONE, SANDSTONE, SHALE, CONGLOMERATE, LIMESTONE, AND TUFF

OLIGOCENE(?)
- VAQUEROS AND SESPE FORMATIONS: CONTINENTAL RED CONGLOMERATE AND SANDSTONE

EOCENE
- E — MARTINEZ FORMATION: MARINE CONGLOMERATE, SANDSTONE, SANDY SHALE, AND SHALE

PALEOCENE(?)
- E-K — UNDIVIDED MARTINEZ AND CHICO FORMATIONS

CRETACEOUS, UPPER
- Ks — CHICO FORMATION: UPPER MARINE MEMBER—HARD CONGLOMERATE, SANDSTONE AND SHALE; LOWER CONTINENTAL MEMBER—RED CONGLOMERATE AND SANDSTONE

IGNEOUS AND METAMORPHIC ROCKS

TERTIARY, MIOCENE
- MIDDLE MIOCENE VOLCANIC ROCKS: VOLCANIC FLOWS, BRECCIAS, TUFFS AND INTRUSIVES, CHIEFLY BASALTIC AND ANDESITIC WITH OCCASIONAL ACID ROCKS GENERALLY ASSOCIATED WITH TOPANGA, MODELO, OR PUENTE FORMATIONS

CRETACEOUS, UPPER
- (SANTA MONICA MOUNTAINS): INTRUSIVES OF GRANITE AND GRANODIORITE

JURASSIC
- J — (PALOS VERDES HILLS): CATALINA SCHIST COMPARED WITH FRANCISCAN FORMATION OF THE COAST RANGES VARIED TYPES OF SCHISTOSE ROCKS

TRIASSIC
- SANTA MONICA SLATE: GREY TO BLACK SLATE, SPOTTED SLATE, MICA SCHIST WITH QUARTZ VEINS

SCALE OF MILES

1 0 1 2 3

LEGEND

- FAULT (DASHED WHERE APPROXIMATLY LOCATED; U-UPTHROWN SIDE; D-DOWNTHROWN SIDE)
- CONCEALED FAULT
- ANTICLINE (DASHED WHERE APPROXIMATLY LOCATED.
- SYNCLINE (DASHED WHERE APPROXIMATLY LOCATED.
- CONTACT (DASHED WHERE APPROXIMATLY LOCATED.
- ● A5 WELLS USED IN PREPARATION OF GEOLOGIC SECTIONS.
- A——A' LINE LOCATION OF GEOLOGIC SECTIONS SHOWN ON PLATES 6A THROUGH 6G

REFERENCE:
CDWR, BULLETIN NO. 104, 1961.

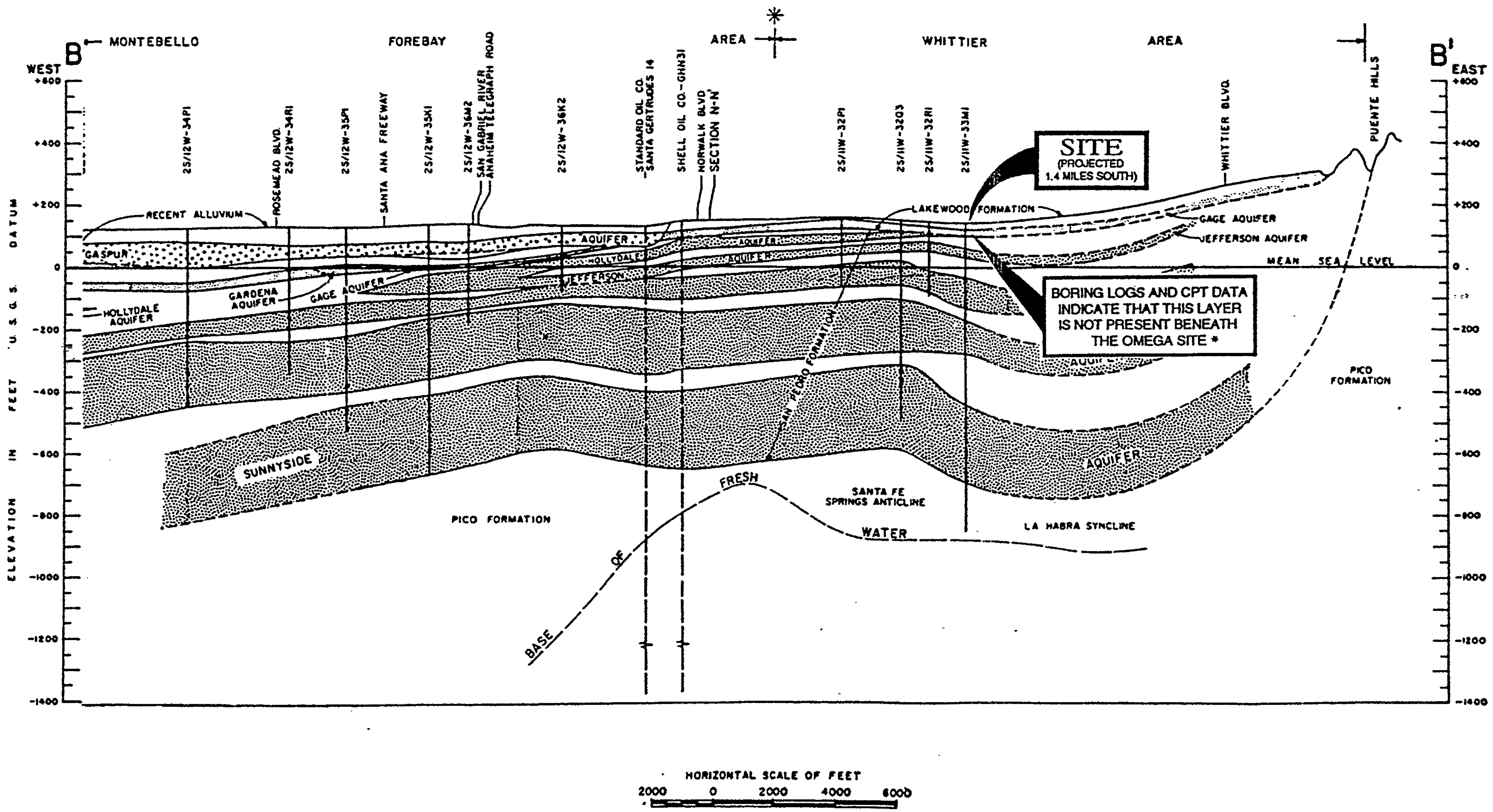
FIGURE 9

AEREAL GEOLOGY

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS+ASSOCIATES, INC.



LEGEND

- AQUICLUDES AND DEEPER UNDIFFERENTIATED FORMATIONS
- AQUIFERS IN RECENT ALLUVIUM (INCLUDES THE GASPUR AND BALLONA AQUIFERS)
- AQUIFERS IN LAKEWOOD FORMATION (INCLUDES THE ARTESIA, EXPOSITION, GAGE, AND GARDENA AQUIFERS)
- AQUIFERS IN SAN PEDRO FORMATION (INCLUDES THE HOLLYDALE, JEFFERSON, LYNWOOD, SILVERADO, AND SUNNYSIDE AQUIFERS)
- WATER WELLS
- OIL WELLS
- FAULTS

* Please see Figure 12

REFERENCE:
CDWR, BULLETIN NO. 104, 1961.

FIGURE 10

DWR CROSS SECTION B-B' (PORTION)

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS+ASSOCIATES, INC.

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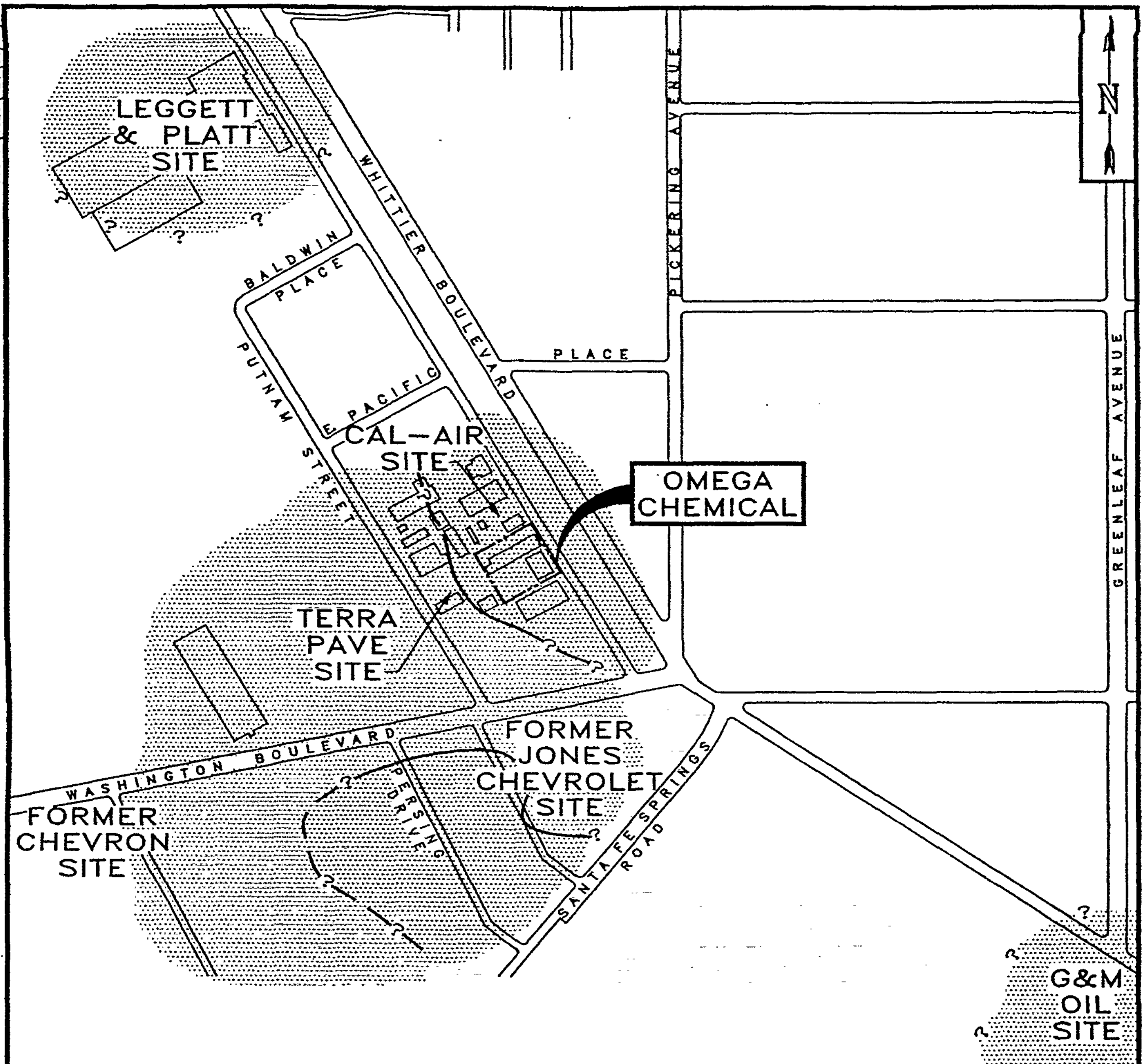

EXPLANATION

SANDY UNIT ENCOUNTERED IN SOIL BORINGS

SANDY UNIT NOT ENCOUNTERED IN SOIL BORINGS

SOURCE:
CITY OF WHITTIER (BASE); McLAREN HART, 1994;
BECHTEL, 1995; ATEC, 1994–95; ATLAS, 1995.

FIGURE 11

PRESENCE OF SANDY UNIT IN SUBSURFACE

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
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HARGIS + ASSOCIATES, INC.

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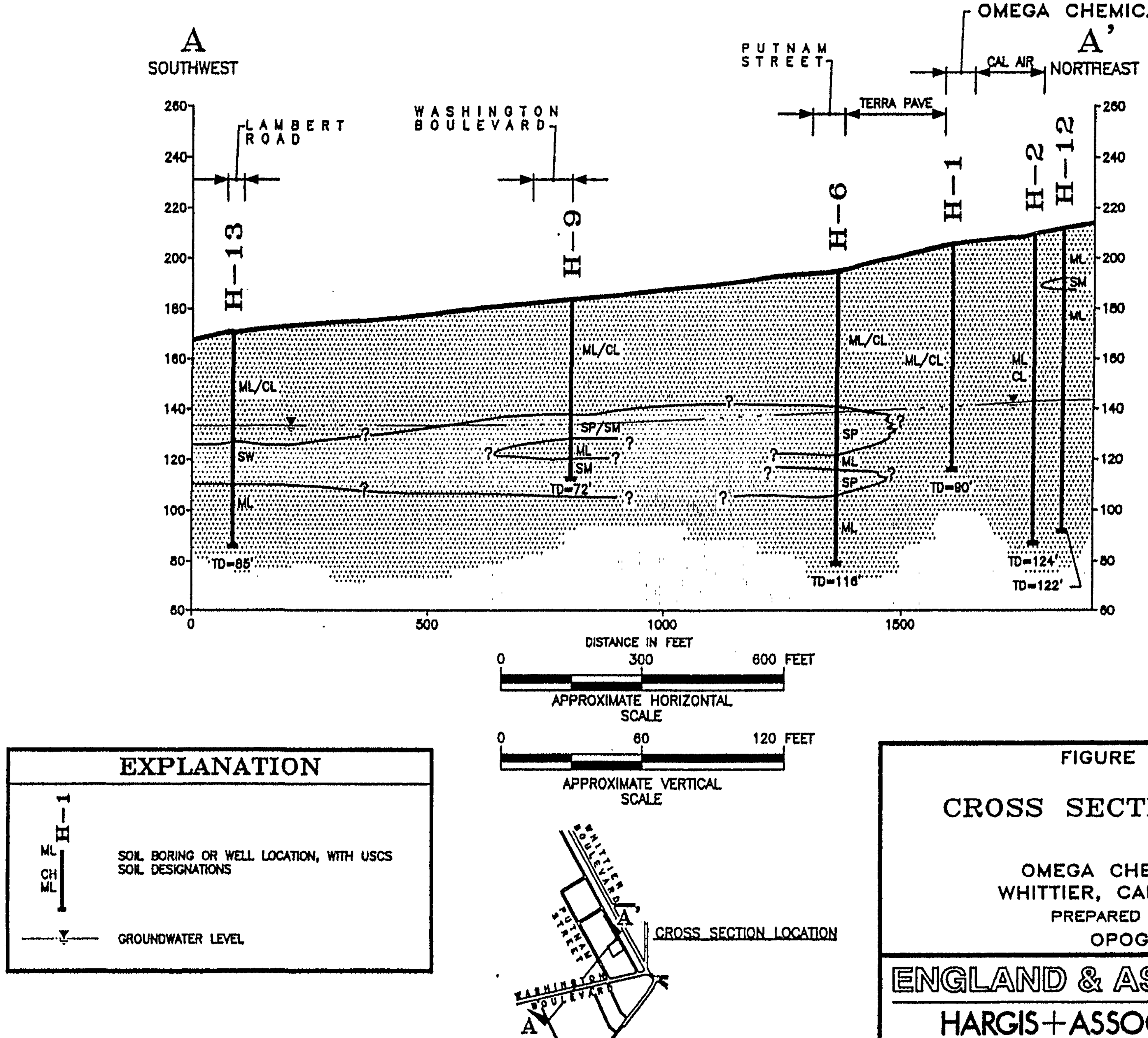

FIGURE 12

CROSS SECTION A-A'

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

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HARGIS+ASSOCIATES, INC.

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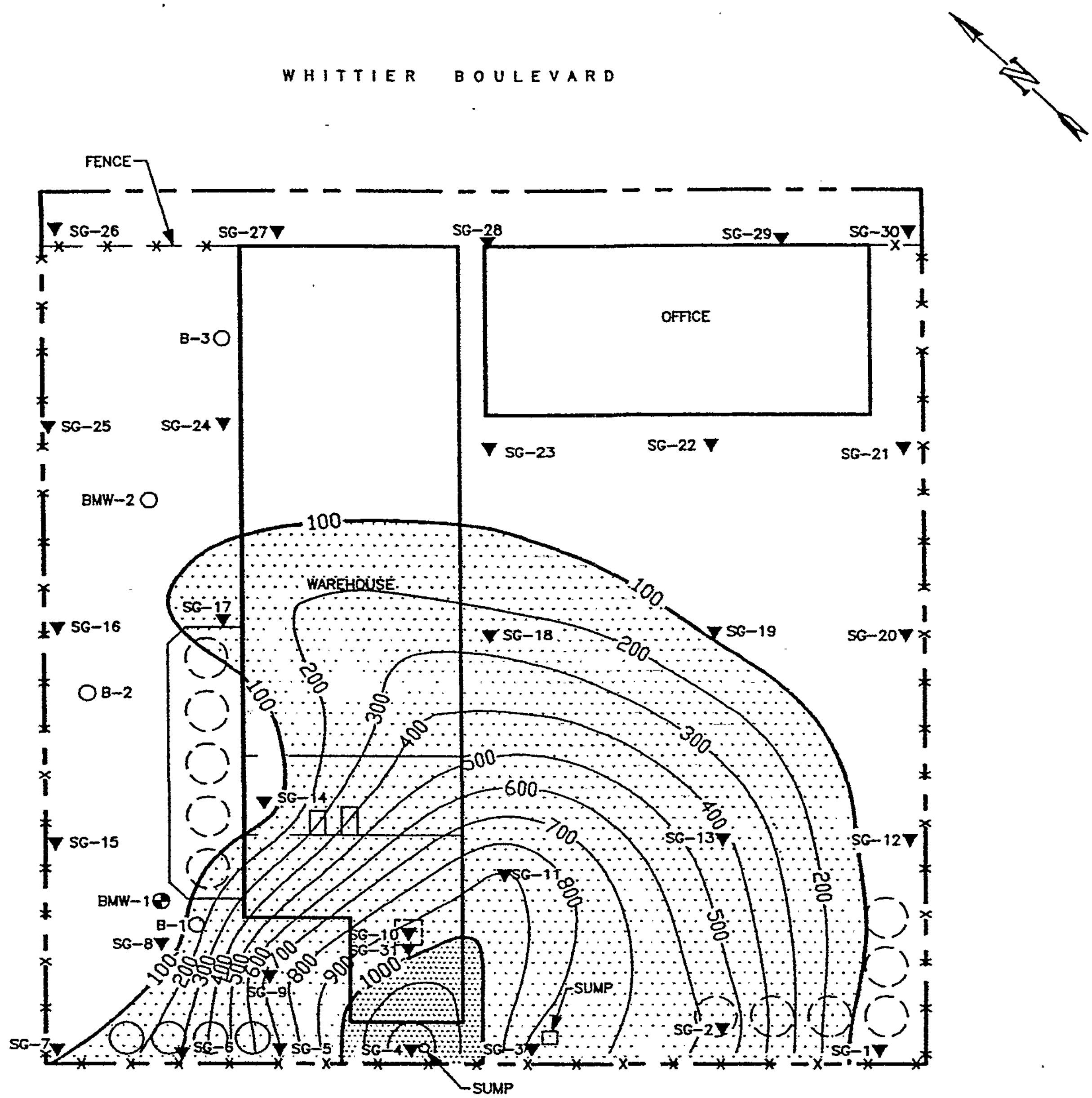
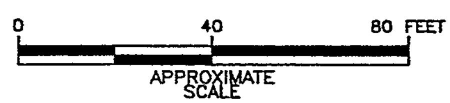


NOTE: EXCLUDES SG-10 AND SG-31.



EXPLANATION

B-2 ○	ENSR SOIL BORING
BMW-1	ENSR GROUND WATER MONITORING WELL
SG-30 ▼	SOIL GAS SAMPLE POINT
1600	CONTAMINANT ISOCON (ug/l)
	PCE > 1000 µg/l
	1000 > PCE > 100 µg/l

FIGURE 13

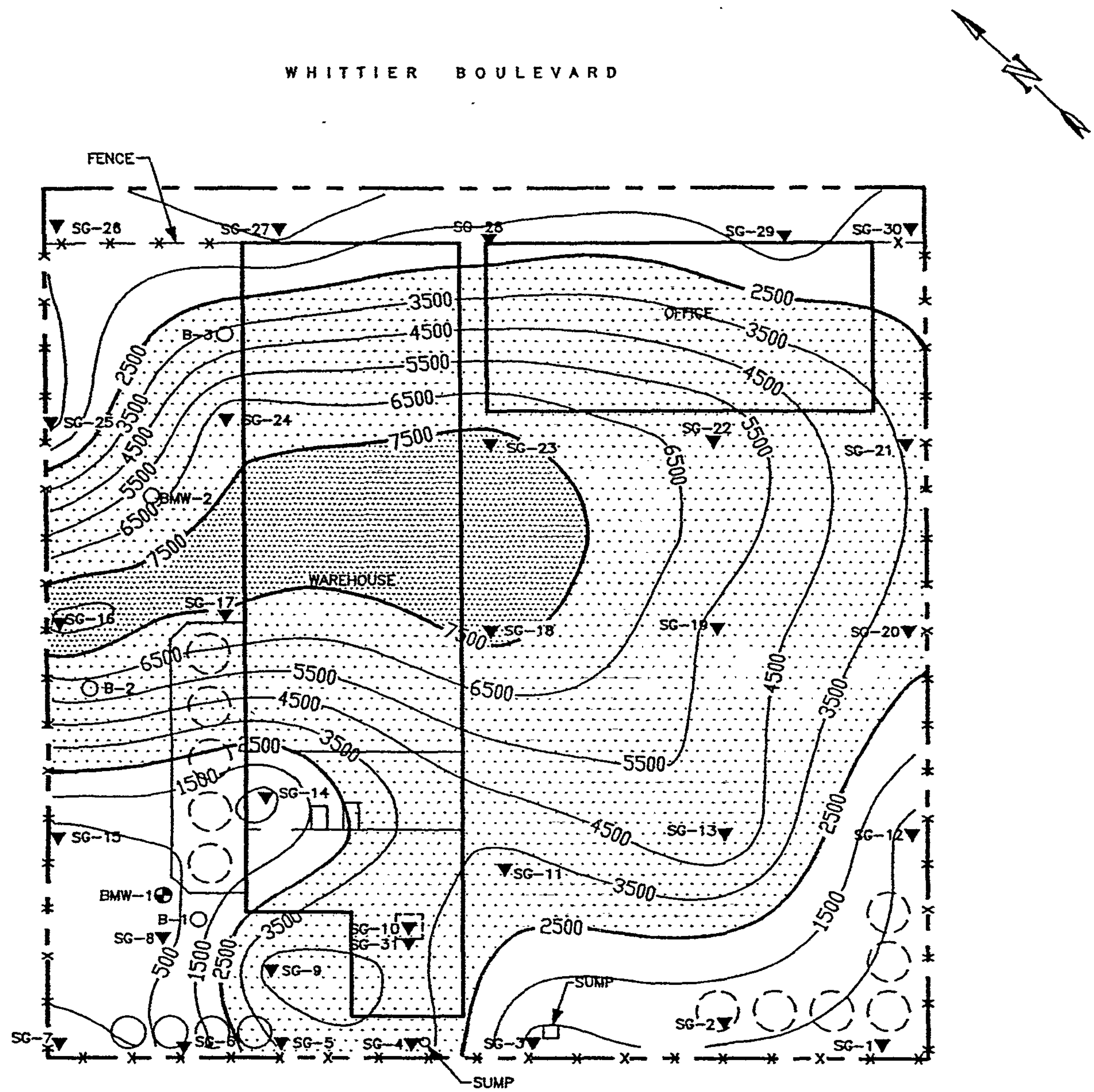
PERCHLOROETHYLENE (PCE) IN SOIL GAS: 6-FOOT DEPTH

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS + ASSOCIATES, INC.

NOTE:
ALL LOCATIONS APPROXIMATE.



NOTE: EXCLUDES SG-10 AND SG-31.

0 40 80 FEET

APPROXIMATE SCALE

EXPLANATION

B-2 ○	ENSR SOIL BORING
BMW-1	ENSR GROUND WATER MONITORING WELL
SG-30 ▼	SOIL GAS SAMPLE POINT
1600	CONTAMINANT ISOCON (ug/l)
	F-113 > 7500 µg/l
	7500 > F-113 > 2500 µg/l

FIGURE 14

FREON-113 IN SOIL GAS: 6-FOOT DEPTH

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS+ASSOCIATES, INC.

NOTE:
ALL LOCATIONS APPROXIMATE.

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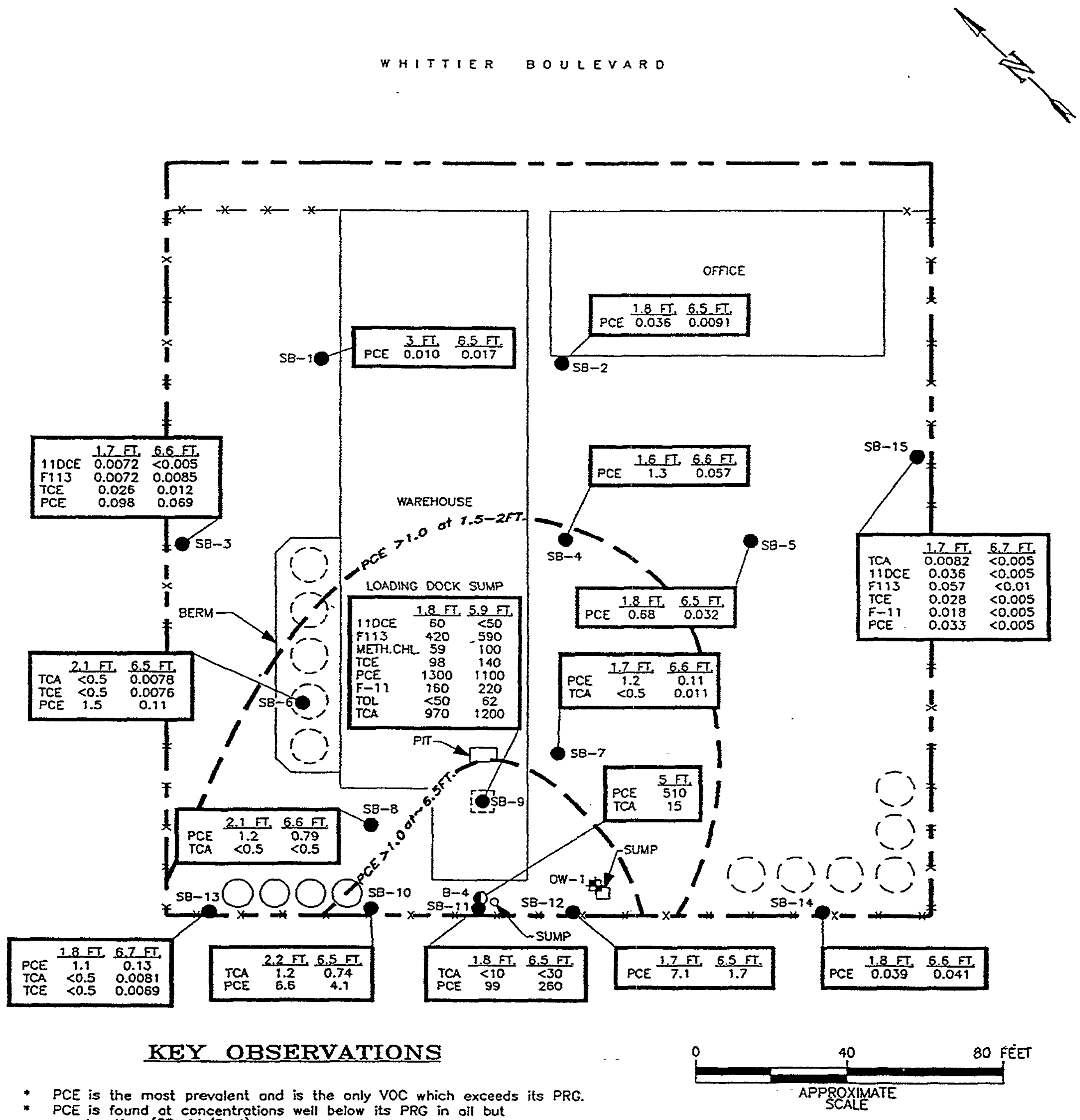

KEY OBSERVATIONS

- PCE is the most prevalent and is the only VOC which exceeds its PRG.
- PCE is found at concentrations well below its PRG in all but one location (SB-11/B-4).
- The soil gas PCE hot spots correspond with highest PCE concentrations in soil.
- Freon 113 is virtually absent from the soil samples despite high soil gas concentrations.

EXPLANATION

SB-15 ●	SHALLOW SOIL SAMPLING LOCATION
OW-1 ⊞	GROUND WATER MONITORING WELL LOCATION
B-4 ◐	DEEP SOIL BORING LOCATION

CONCENTRATIONS IN mg/kg

NOTE:
ALL LOCATIONS APPROXIMATE.

FIGURE 15

VOC RESULTS FOR SHALLOW SOIL

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS + ASSOCIATES, INC.

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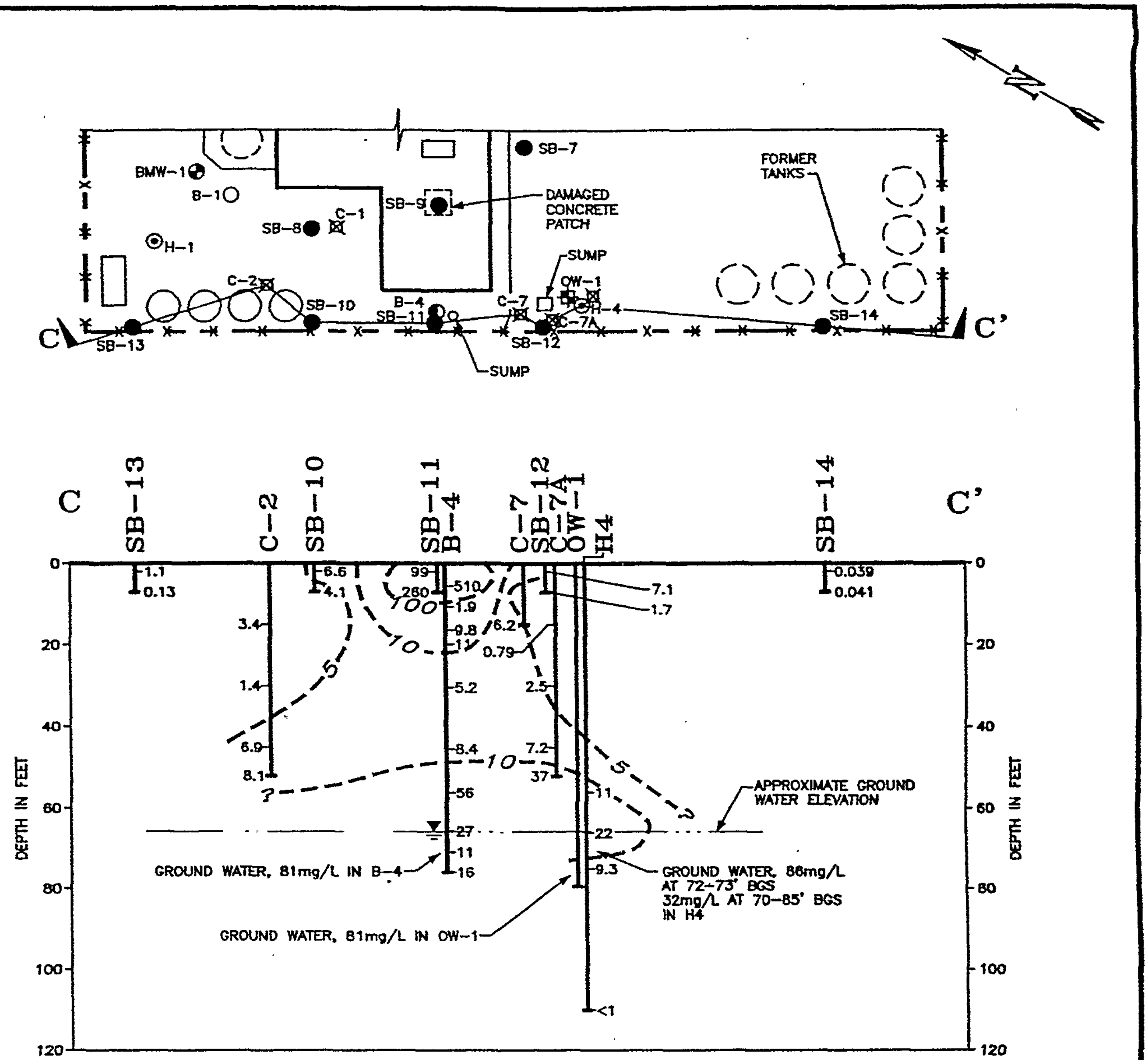

0 40 80 FEET

APPROXIMATE SCALE

EXPLANATION

B-2 ○	ENSR SOIL BORING
BMW-1	FORMER ENSR GROUND WATER MONITORING WELL
H-4 ⊙	CPT LOCATION (ENGLAND & HARGIS, 1996)
C-7 ⊠	OTHER SOIL SAMPLING LOCATION (ENGLAND & HARGIS, 1996)
SB-15 ●	SHALLOW SOIL SAMPLING LOCATION
0.79	PCE CONCENTRATION IN mg/kg IN SOIL
10	PCE CONCENTRATION CONTOUR IN mg/kg

NOTE:
LOCATIONS APPROXIMATE.

FIGURE 16

CROSS SECTION SHOWING PCE IN SOIL AND GROUND WATER

OMEGA CHEMICAL
WHITTIER, CALIFORNIA

PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS+ASSOCIATES, INC.

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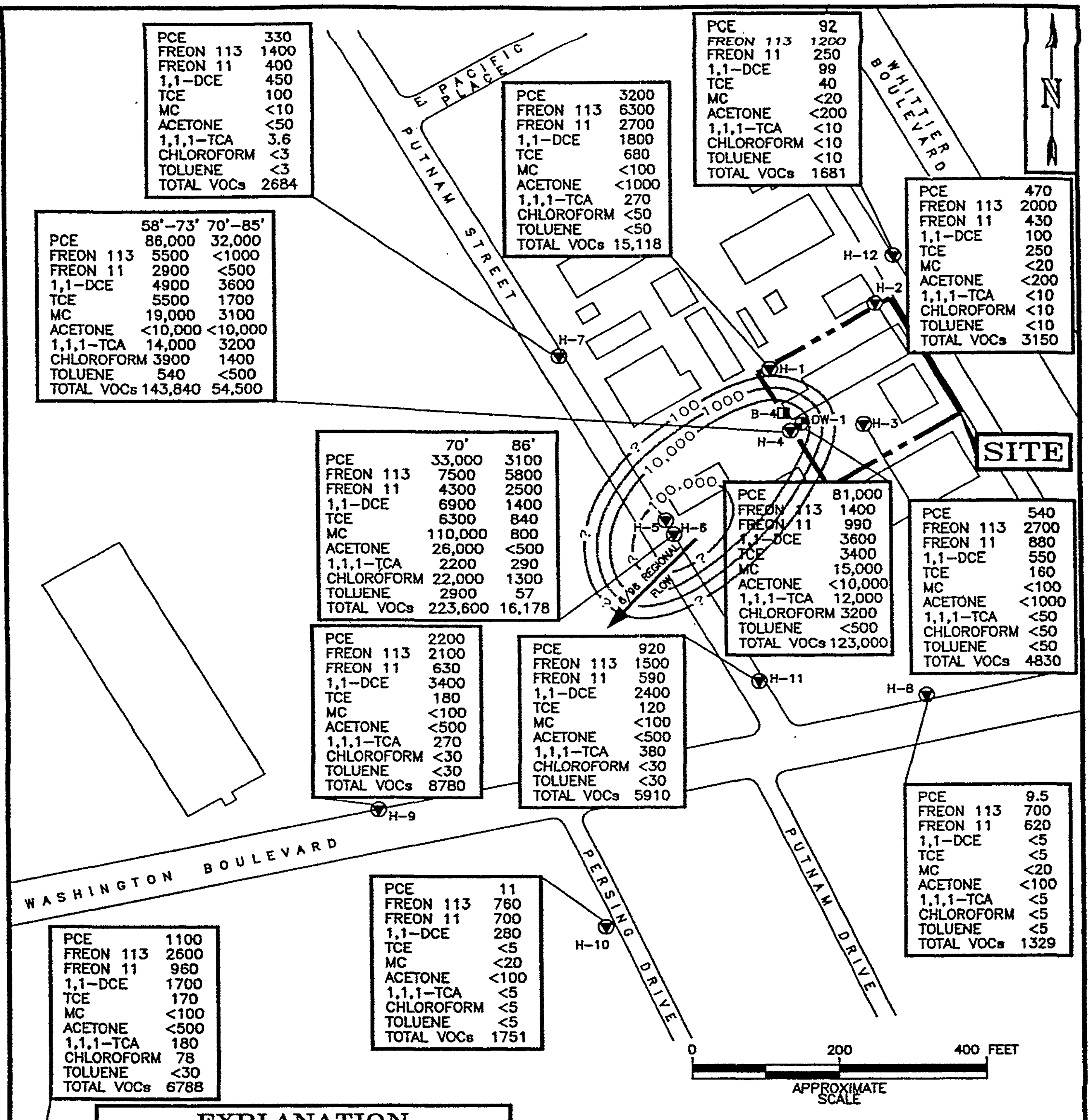

FIGURE 17

SUMMARY OF GROUND WATER ANALYTICAL RESULTS

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS + ASSOCIATES, INC.

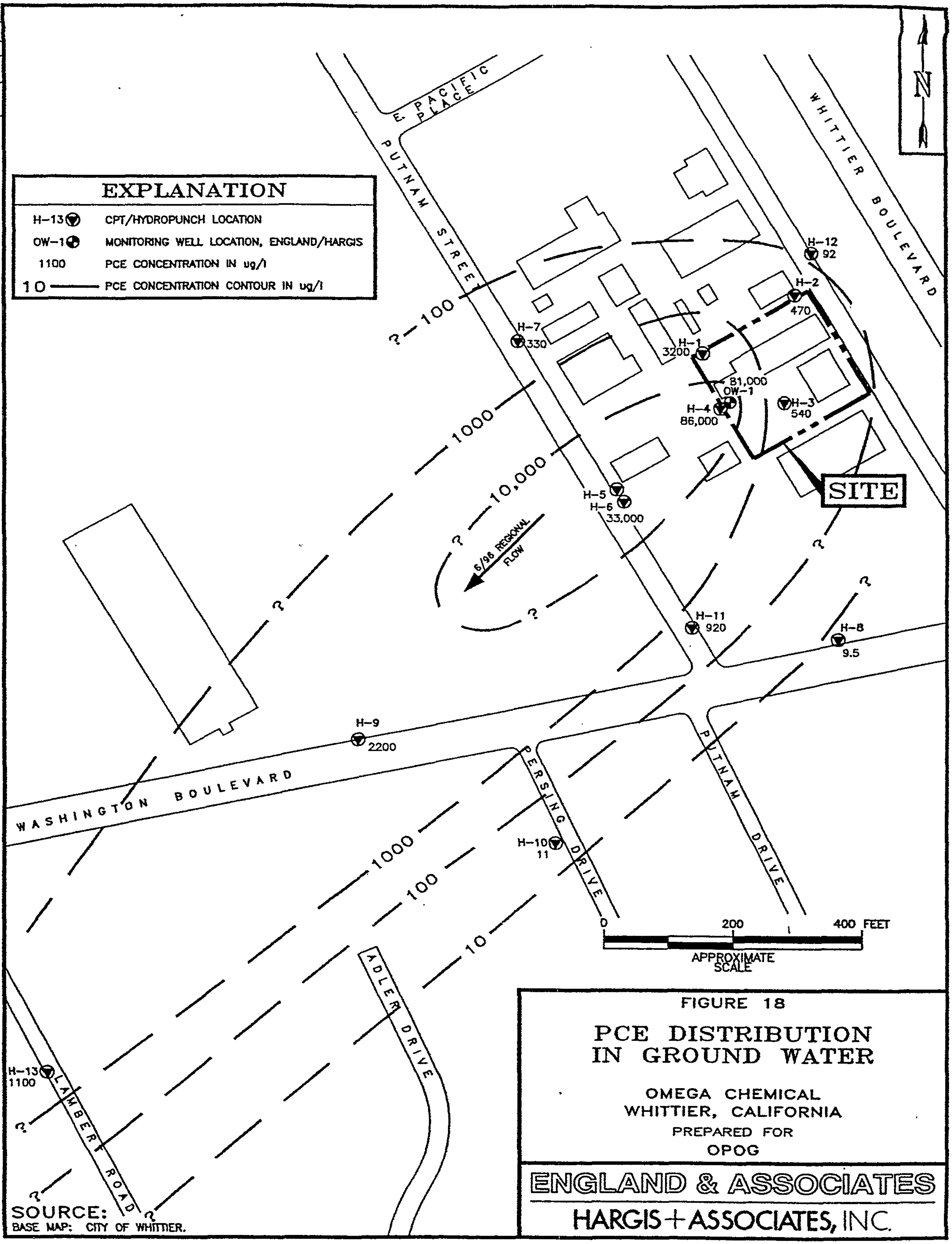

FIGURE 18

PCE DISTRIBUTION IN GROUND WATER

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS + ASSOCIATES, INC.

SOURCE:
BASE MAP: CITY OF WHITTIER.

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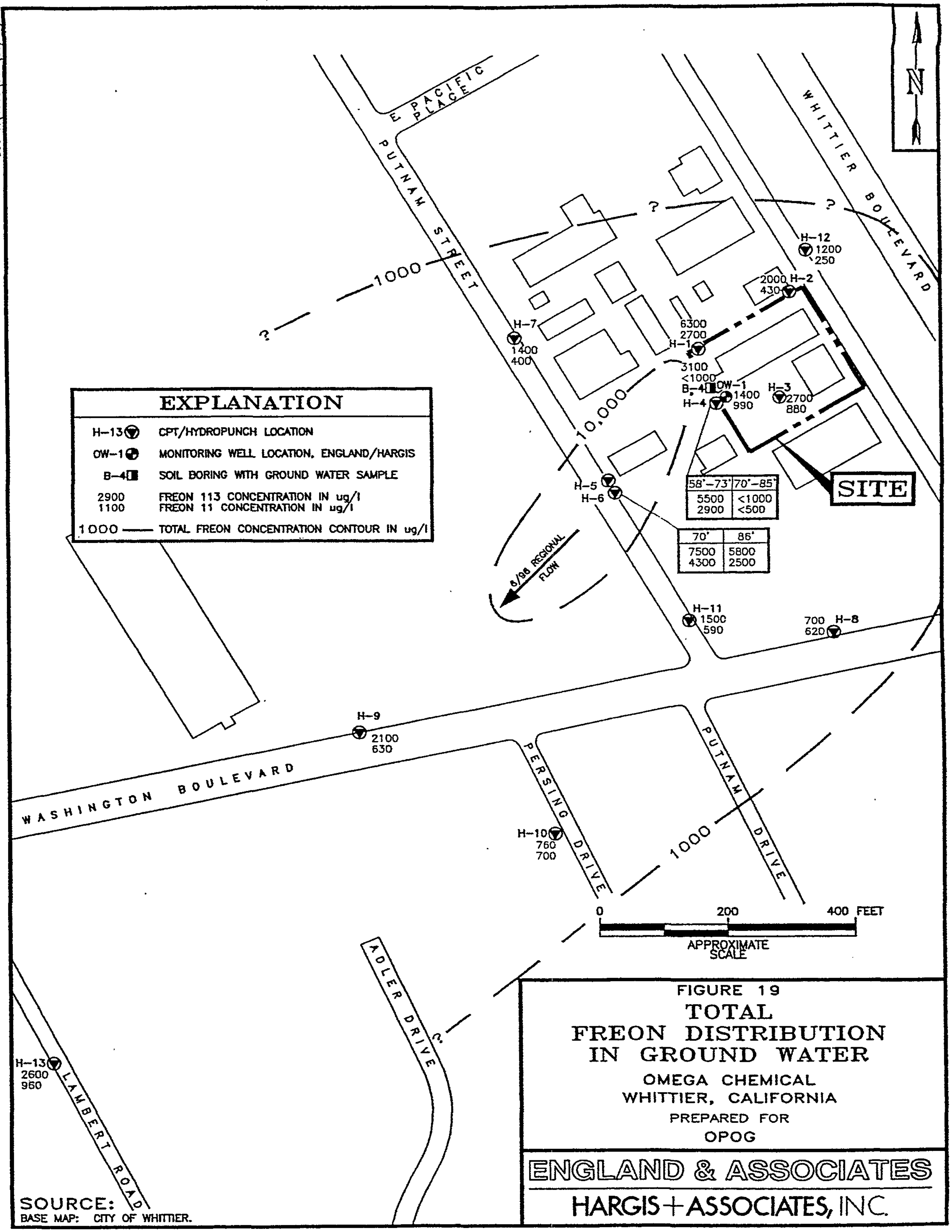


FIGURE 19
TOTAL FREON DISTRIBUTION IN GROUND WATER
OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES
HARGIS + ASSOCIATES, INC.

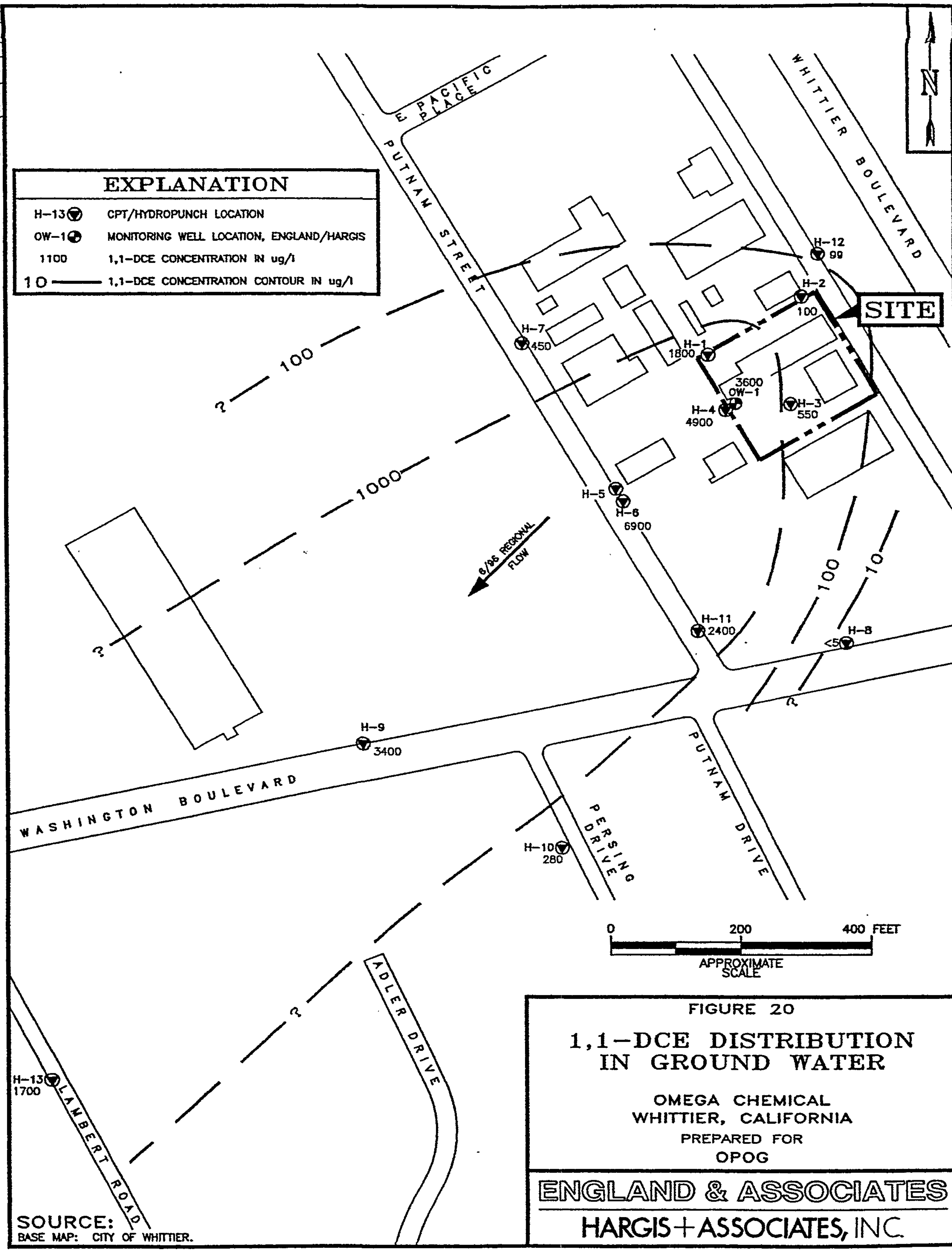


FIGURE 20

1,1-DCE DISTRIBUTION IN GROUND WATER

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES
HARGIS+ASSOCIATES, INC.

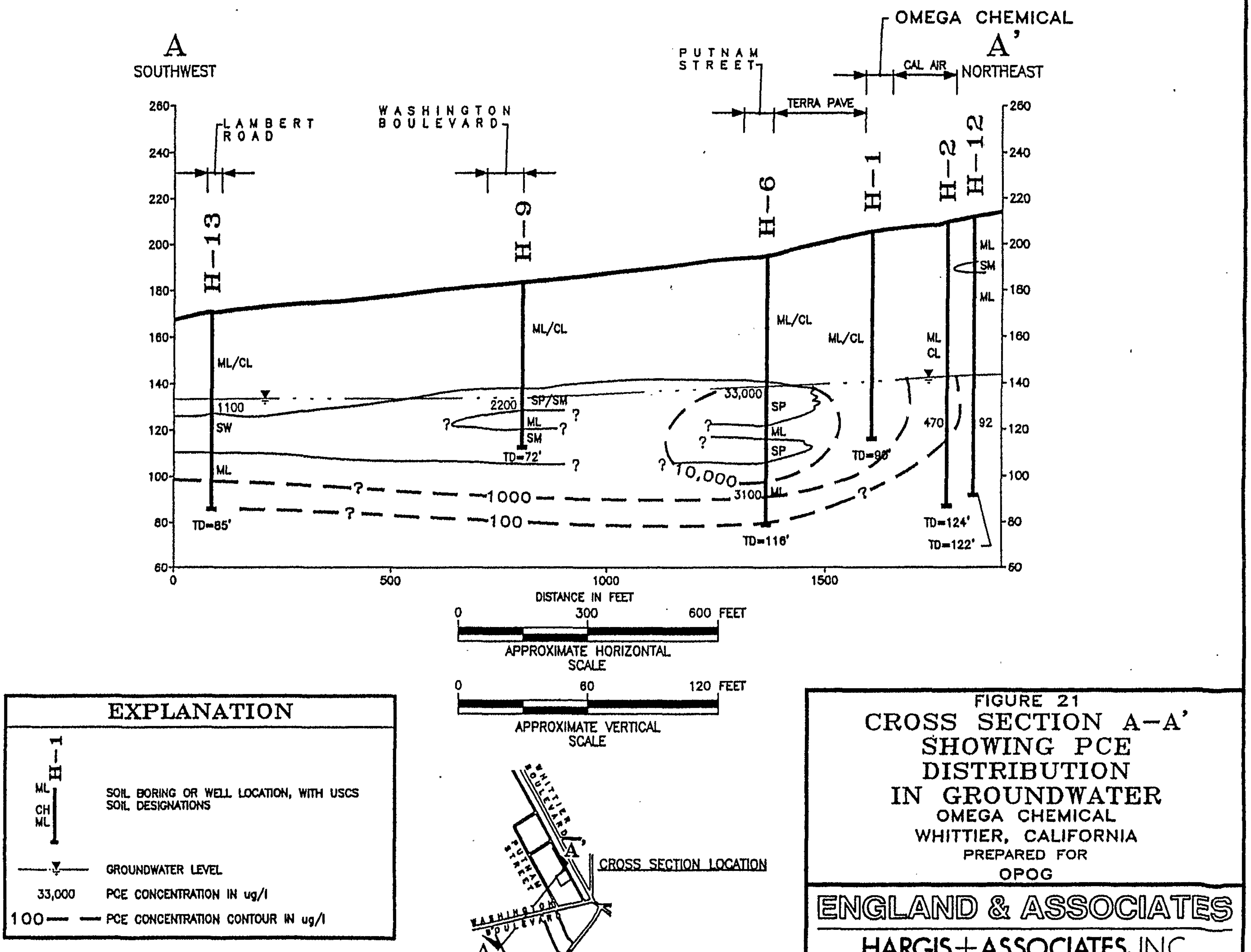


FIGURE 21
CROSS SECTION A–A' SHOWING PCE DISTRIBUTION IN GROUNDWATER
OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS+ASSOCIATES, INC.

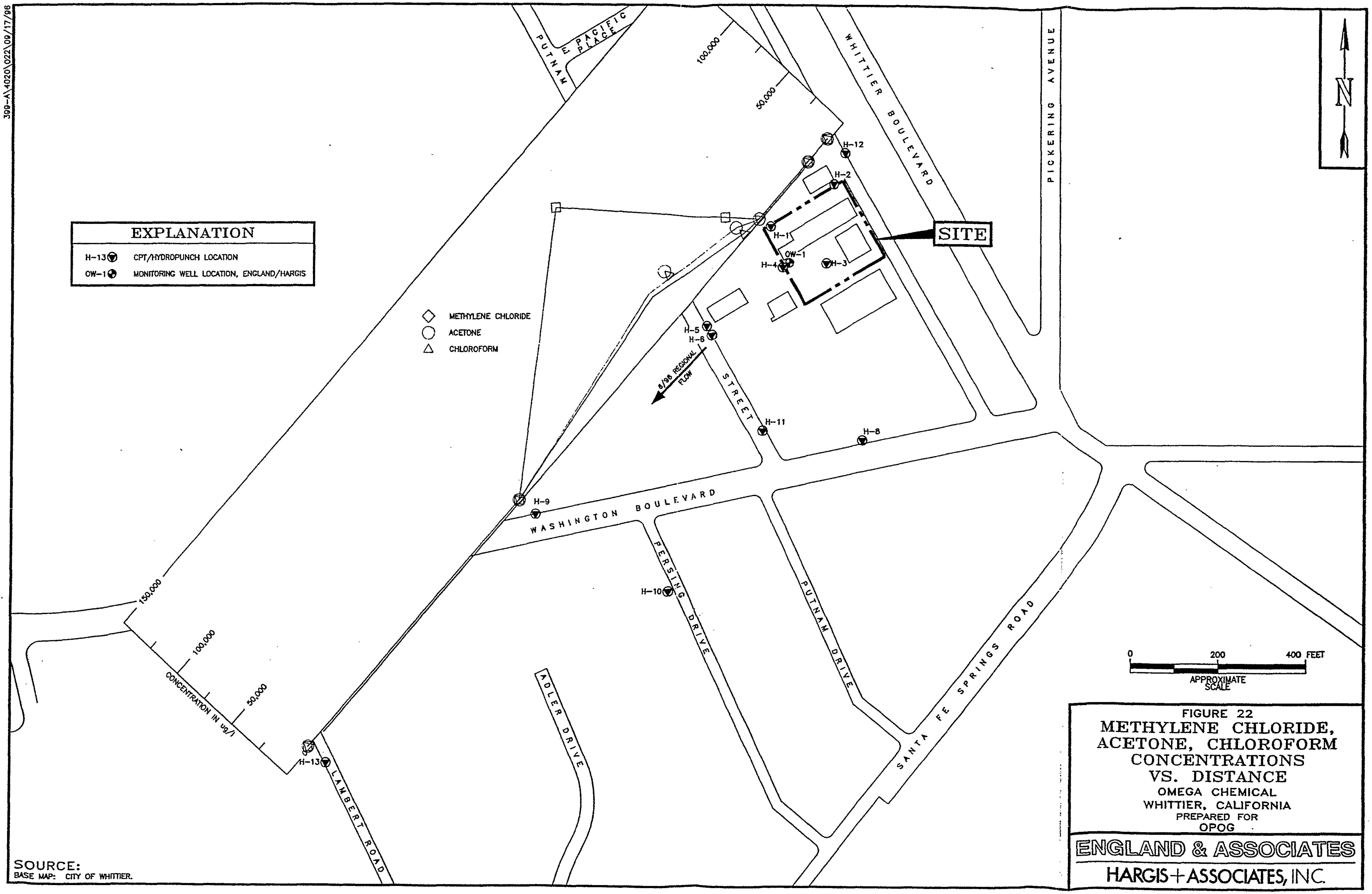


FIGURE 22
METHYLENE CHLORIDE, ACETONE, CHLOROFORM CONCENTRATIONS VS. DISTANCE
OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES
HARGIS+ASSOCIATES, INC.

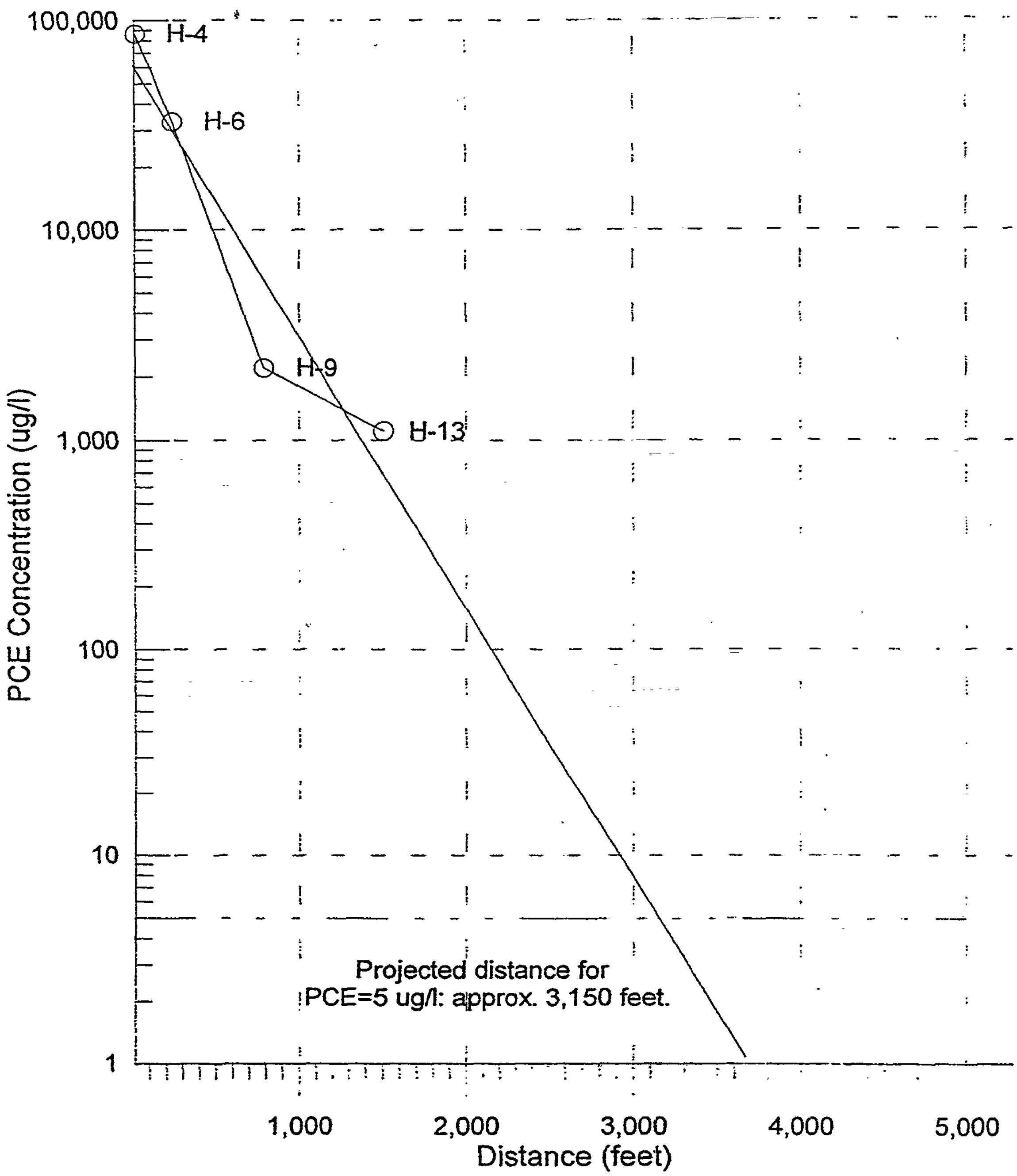


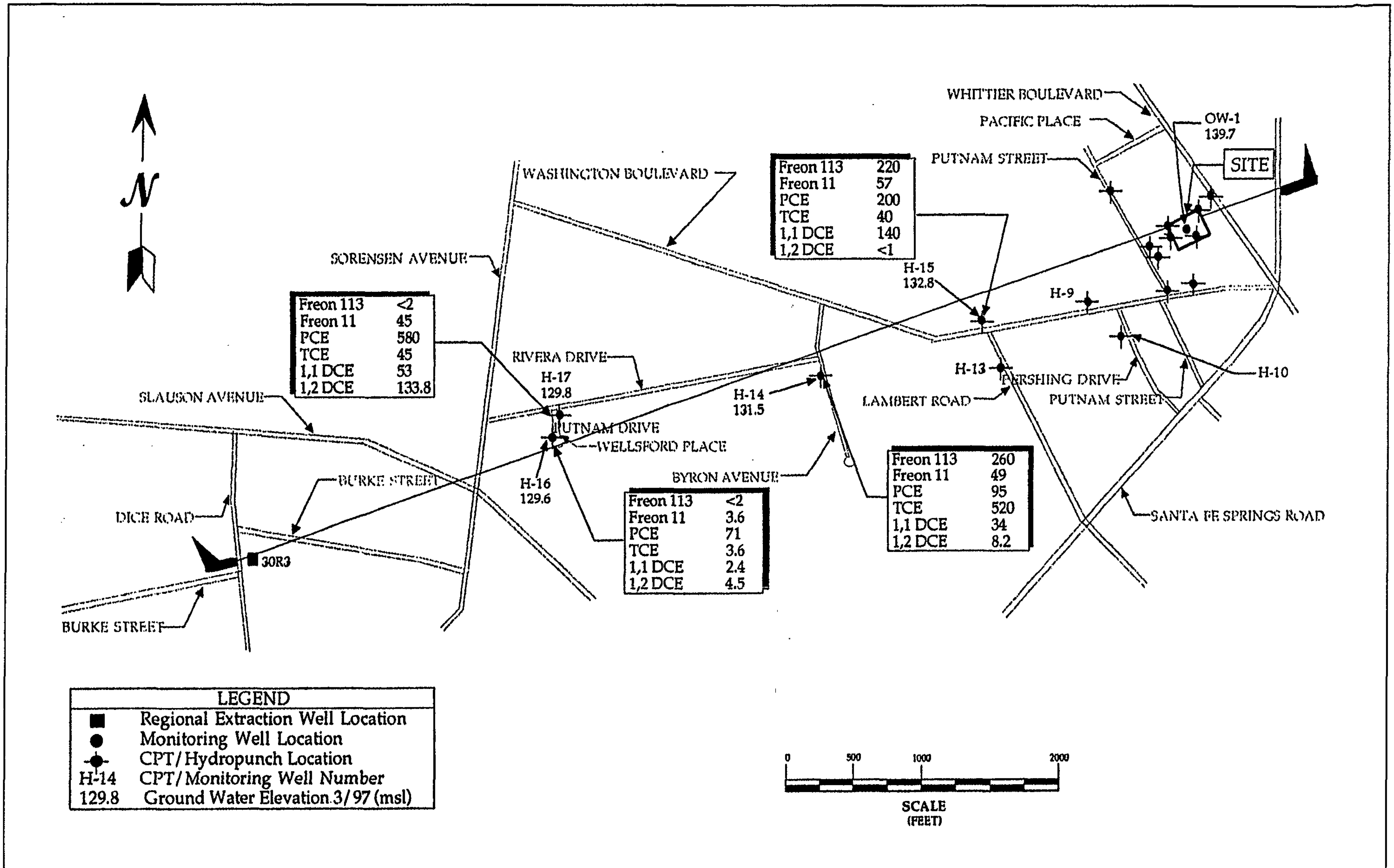
FIGURE 23

GRAPH OF
LOG PCE CONCENTRATION
VS. DISTANCE

OMEGA CHEMICAL
WHITTIER, CALIFORNIA
PREPARED FOR
OPOG

ENGLAND & ASSOCIATES

HARGIS+ASSOCIATES, INC.



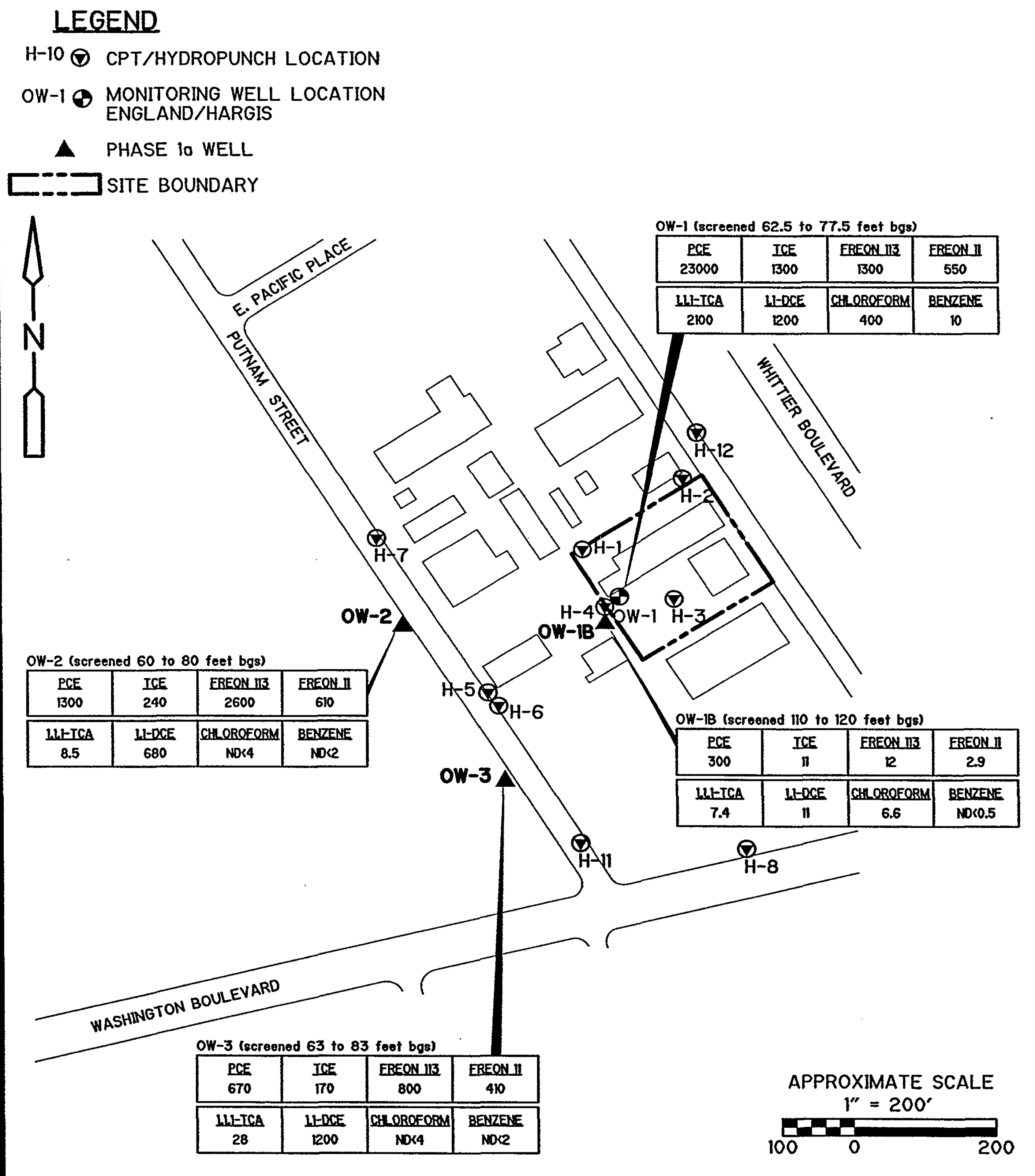
SOURCE: Figure 1, Technical memorandum no. 11A, 2 REM, April 30, 1997.

OMEGA CHEMICAL

CDM
environmental engineers, scientists, planners, & management consultants

ANALYTICAL RESULTS FROM CPT/HYDROPUNCH GROUND WATER INVESTIGATION

Figure 1-4



OW-1 (screened 62.5 to 77.5 feet bgs)

PCE	TCE	FREON 113	FREON 11
23000	1300	1300	550
1,1,1-TCA	**1,1-DCE**	**CHLOROFORM**	**BENZENE**
2100	1200	400	10

OW-1B (screened 110 to 120 feet bgs)

PCE	TCE	FREON 113	FREON 11
300	11	12	2.9
1,1,1-TCA	**1,1-DCE**	**CHLOROFORM**	**BENZENE**
7.4	11	6.6	ND<0.5

OW-2 (screened 60 to 80 feet bgs)

PCE	TCE	FREON 113	FREON 11
1300	240	2600	610
1,1,1-TCA	**1,1-DCE**	**CHLOROFORM**	**BENZENE**
8.5	680	ND<4	ND<2

OW-3 (screened 63 to 83 feet bgs)

PCE	TCE	FREON 113	FREON 11
670	170	800	410
1,1,1-TCA	**1,1-DCE**	**CHLOROFORM**	**BENZENE**
28	1200	ND<4	ND<2

Note: All concentrations in micrograms per liter.

OMEGA CHEMICAL

JULY 1999 WATER QUALITY SAMPLING RESULTS
SELECTED VOLATILE ORGANIC COMPOUNDS

CDM
environmental engineers, scientists, planners, & management consultants

Figure 4-2

J:\10500\CAD\PLANS\ Fig4-2 09/24/99 14:07:12 4:53:28 Negretegd

Appendix B
Lithologic Logs and Well Completion Drawings

BORING 1

DATE DRILLED: April 22, 1985

EQUIPMENT USED: 6"-Diameter Hand Auger

ELEVATION (ft.)	DEPTH (ft.)	"N" VALUE STD. PEN. TEST	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC.

ELEVATION

ML

3" Asphaltic Concrete, decomposed surface is loose

FILL - Gravel base, Silty Sand, fine to coarse Sand with gravel, moderate amounts of Silt and Clay, yellowish-orange

ML

FILL - CLAYEY SILT - soft, slightly damp to damp, dark grey to dark bluish-grey
Strong sweet odor
At 2' small pieces of concrete and brick, yellowish-brown mottling, blue-purple sheen on soil

CLAYEY SILT - slight amounts of fine Sand, few pebbles, yellowish-brown, moderately strong odor
At 4.5' moderate odor
At 6' no detectable odor

5

10

15

NOTES: Terminated boring at 6'. Contaminant odor detected from .5' to about 5' in boring. No water or fluid encountered. Borehole backfilled and tamped with auger tool.

BORING 2

DATE DRILLED: April 22, 1985

EQUIPMENT USED: 6"-Diameter Hand Auger

ELEVATION

ML

4" Asphaltic Concrete, moderately firm to hard, surface is soft and decomposed

FILL - Gravel base, Silty Sand, fine to coarse Sand with gravel, moderate amounts of Silt and Clay, yellowish-orange

ML

FILL - CLAYEY SILT - soft, mottled, pieces of concrete and brick, dark greenish-grey
At 1.4' blue-purple sheen on soil, very strong odor, soil is greyish-brown
At 2' no sheen

CLAYEY SILT - moderate amounts of fine Sand, few pebbles, slightly damp, dark yellowish-brown, thin caliche seams
Moderate odor
At 6' no detectable odor

5

10

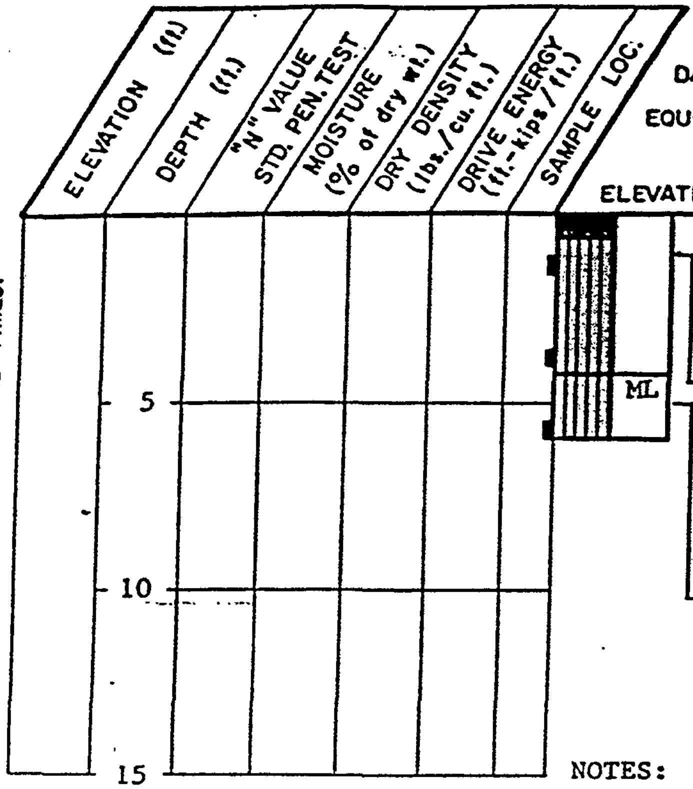
15

NOTES: Terminated boring at 6'. Contaminant odor detected from .5' to about 5'. No water or fluid encountered. Backfilled borehole and tamped with auger tool.

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES



BORING 3

DATE DRILLED: April 22, 1985

EQUIPMENT USED: 6"-Diameter Hand Auger

3.5" Asphaltic Concrete, firm to hard, surface is loose

FILL - Gravel base, Silty Sand; fine to coarse Sand, moderate amounts of Silt, some Clay and gravel, orangish-brown

FILL - SILTY CLAY to CLAYEY SILT - dark bluish-brown to dark grey
At 1' small pieces of concrete and brick, slightly damp to damp, firm, dark greyish-brown, moderate odor
At 2' slightly less firm, less debris. slight odor

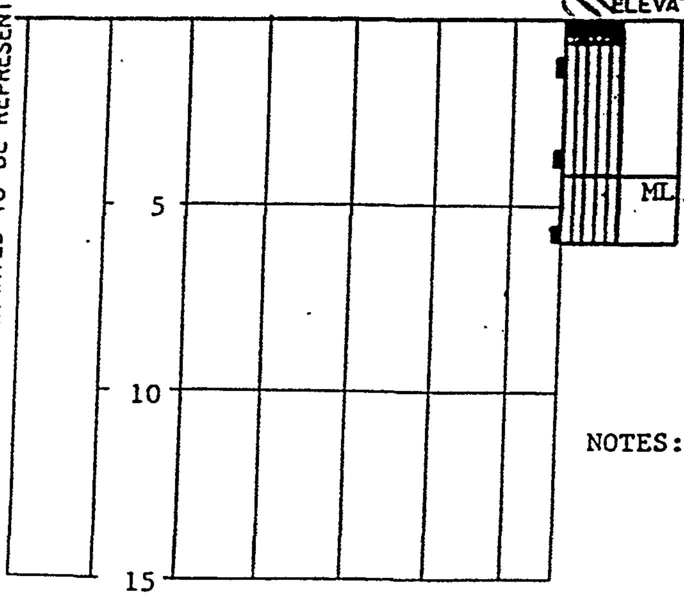
CLAYEY SILT - moderate amounts of fine Sand, few pebbles and gravel, moderately firm, yellowish-brown, thin caliche seams
No detectable odor

NOTES: End of boring at 6'. Contaminant odor detected from .5' to about 3'. No water or fluid encountered. Borehole backfilled and tamped with auger tool.

BORING 4

DATE DRILLED: April 22, 1985

EQUIPMENT USED: 6"-Diameter Hand Auger



4" Asphaltic Concrete, hard

FILL - Gravel base, Silty Sand, fine to coarse Sand, moderate some Sand, Clay and gravel

FILL - SILTY CLAY and CLAYEY SILT - small pieces of brick, few pebbles, dark bluish-grey to greyish-brown
At 2' no apparent debris, some very fine Sand, no detectable odor

CLAYEY SILT - some very fine Sand, few small pebbles, moderately firm, moderately damp, thin caliche seams, no detectable odor

NOTES: Terminated boring at 6'. No detectable odor from borehole or materials. No water or fluid encountered. Backfilled borehole and tamped with auger tool.

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

[redacted] F SU[redacted]RFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

BORING 5

DATE DRILLED: May 30, 1985

EQUIPMENT USED: 6"-Diameter Hand Auger

ELEVATION (ft.)	DEPTH (ft.)	"N" VALUE STD. PEN. TEST	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC.
	5					
	10					
	15					

ELEVATION

ML — FILL - CLAYEY SILT - porous, damp, dark grey to black

ML — CLAYEY SILT - damp, brown to yellowish-brown

SAND - poorly graded, medium grained with 5% to 10% gravel, damp

NOTES: Terminated boring at 7.5' due to difficult drilling. No water or fluid encountered. Boring backfilled and tamped with auger.

OMEGA CONFIDENTIAL

BORING 1a

DATE DRILLED:

EQUIPMENT USED: 6"-Diameter Hand Auger

ELEVATION (ft.)	DEPTH (ft.)	"N" VALUE STD. PEN. TEST	MOISTURE (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	DRIVE ENERGY (ft.-kips/ft.)	SAMPLE LOC.
	5					
	10					
	15					

ELEVATION

See Log of Boring 1 for 0' to 6' (backfilled)

ML — CLAYEY SILT - few gravel, damp, yellowish-brown
5% to 10% gravel upto 4" diameter
Very firm to hard
No detectable odor

NOTES: Terminated boring at 9' due to difficult drilling. No water or fluid encountered. Boring backfilled and tamped with auger tool.

LOG OF BORING

LeROY CRANDALL AND ASSOCIATES

ERT.
AN ENSR COMPANY

SUBSURFACE EXPLORATION — LITHOLOGIC LOG OF B-1

Client : THOMSON & NELSON
Project Name : OMEGA RECOVERY
Project Location : WHITTIER, CA.
Job Number : 6715-001-200 Boring No : B-1
Logged By : M. WOOD
Approved By :
Drilled By : A & R DRILLING

DRILLING AND SAMPLING INFORMATION
Date Started : 3/19/88 Date Completed : 3/19/88
Method : HSA Total Depth : 36 FEET

WELL COMPLETION INFORMATION
Screen Dia : Length :
Slot Size : Type :
Casing Dia : Length :

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 210 FEET, U.S.G.S. WHITTIER, CA.	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
	2-inches Asphaltic Concrete QUATERNARY ALLUVIUM (Qal) SILTY CLAY (CL) dark brown, dry to moist, soft, slightly plastic, trace of fine gravel, trace of white caliche								
5		5	SS	1.5	4	5			
10	becomes light brown	10	SS	1.5	8	0			
	GRAVELLY CLAY (ML/CL) light brown, dry to moist, stiff to very firm, slightly plastic, white fracture coatings, up to 10% fine to coarse gravel								
15		15	SS	1.5	15	20+			
	CLAYEY SILT (ML)/SILTY CLAY (CL) brown, moist, stiff, non-plastic to slightly plastic, trace of coarse to fine grained sand								
20		20	SS	1.5	19	48			
25		25	SS	1.5	13	38			
30	no recovery	30	SS	0	X	X			
	continued (ML/CL)								
35		35	SS	1	15	100+			
	Bottom of boring at 36 feet. No groundwater encountered.								
40									
45									
50									
55	* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)								

SAMPLER TYPE
SS – DRIVEN SPLIT SPOON RC – ROCK CORE
ST – PRESSED SHELBY TUBE CT – CONTINUOUS TUBE

BORING METHOD
HSA – HOLLOW STEM AUGER DC – DRIVING CASING
CFA – CONTINUOUS FLIGHT AUGERS MD – MUD DRILLING

ERT.
AN ENSR COMPANY -

SUBSURFACE EXPLORATION

LITHOLOGIC LOG OF B-2

Client : THOMSON & NELSON
Project Name : OMEGA RECOVERY
Project Location : WHITTIER, CA
Job Number : 6715-001-200 Boring No : B-2
Logged By : M. WOOD
Approved By :
Drilled By : A&R DRILLING

DRILLING AND SAMPLING INFORMATION
Date Started : 3/19/88 Date Completed : 3/19/88
Method : HSA Total Depth : 26 FEET

WELL COMPLETION INFORMATION
Screen Dia : Length :
Slot Size : Type :
Casing Dia : Length :

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 213 FEET	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	PID *		GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
	3-inches Asphaltic concrete QUATERNARY ALLUVIUM (Qal) SILTY CLAY (CL) dark brown, soft to firm, moist, slightly plastic, trace of fine gravel, white caliche coatings on fractures									
5		5'	SS		11	20+				
10	continued SILTY CLAY (CL)	10'	SS		9	20+				
	increase in silt and fine gravel									
15		15'	SS		9	40				
20	continued SILTY CLAY (CL) becomes firm with up to 1% fine gravel	20'	SS		11	32				
25	continued SILTY CLAY (CL)	25'	SS		16	14				
	Bottom of hole at 26 feet No groundwater encountered									
30										
35										
40										
45										
50										
55	* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)									

SAMPLER TYPE
SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
RC - ROCK CORE
CT - CONTINUOUS TUBE

BORING METHOD
HSA - HOLLOW STEM AUGER
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASI
MD - MUD DRILLIN

ERT.
AN ENSR COMPANY -

SUBSURFACE EXPLORATION — LITHOLOGIC LOG OF B-3

Client : THOMSON & NELSON
Project Name : OMEGA RECOVERY
Project Location : WHITTIER, CA
Job Number : 6715-001-200 Boring No : B-3
Logged By : M. WOOD
Approved By :
Drilled By : A&R DRILLING

DRILLING AND SAMPLING INFORMATION
Date Started : 3/19/88 Date Completed : 3/19/88
Method : HSA Total Depth : 20.5 FEET

WELL COMPLETION INFORMATION
Screen Dia : Length :
Slot Size : Type :
Casing Dia : Length :

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 216 FEET, U.S.G.S. WHITTIER, CA.	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	PID *		GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
0–5	2-inches Asphaltic concrete, soft QUATERNARY ALLUVIUM (Qal) GRAVELLY SANDY SILT (SM/ML) dark brown, soft to loose, dary to damp, with up to 5% fine to coarse gravel, white caliche on fractures									
5		5'	SS		6	0				
10	SANDY SILT (ML) brown, soft to firm, damp, non-plastic, very fine grained sand, trace of fine gravel	10'	SS		4	0				
15	becomes stiff	15'	SS		27	0				
20	continued SANDY SILT (ML)	20'	SS		6	10				
20.5	Bottom of hole at 20.5 feet No groundwater encountered Hole backfilled with 4 bags of concrete cement									

* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)

ERT.
AN ENSR COMPANY

SUBSURFACE EXPLORATION — LITHOLOGIC LOG OF B-MW-1

Client : THOMSON & NELSON
Project Name : OMEGA RECOVERY
Project Location : WHITTIER, CA
Job Number : 6715-002-200 Boring No : B-MW-1
Logged By : K. PITCHFORD, R.G.
Approved By :
Drilled By : INTERSTATE SOILS SAMPLING

DRILLING AND SAMPLING INFORMATION
Date Started : 6/11/88 Date Completed : 6/12/88
Method : HSA, 10-INCH Total Depth : 110 FEET

WELL COMPLETION INFORMATION
Screen Dia : 4-INCH Length : 10 FEET
Slot Size : 0.02-INCH Type : MILL SLOT
Casing Dia : 4-INCH Length : 90 FEET

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 210 FEET, U.S.G.S. WHITTIER, CA.	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	PID *	TIME	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
	QUATERNARY ALLUVIUM (Qal) SANDY CLAY (CL) medium brown, slightly moist, soft, slightly plastic, no staining or odor									
5	SANDY SILTY CLAY (CL)/CLAYEY SILT (ML) light medium brown, with trace fine to coarse sand and fine gravel, slightly moist, no staining or odor		SS	1.5	13	40	815			
10			SS	1.5	15	35	830			
15	CLAYEY GRAVEL (GC) rounded and angular clasts in sandy-clayey matrix, slightly moist, no staining or odor		SS	1.5	39	20	845			
20	SANDY SILTY CLAY (CL) dark brown, with trace of coarse sand and fine to coarse gravel, slightly moist, no staining or odor		SS	1.5	34	22	855			
25			SS	1.5	30	105	900			
30			SS	1.5	23	102	920			
35			SS	1.5	32	140	1000			
40			SS	1.5		150				
45			SS	1.5	31	50	1110			
50			SS	1.5		68				
55		55	SS	1.5		120				
	SILTY CLAYEY SAND (ML)/SILTY SANDY CLAY (CL) medium dark brown slightly moist, no staining or odor									

SAMPLER TYPE
SS – DRIVEN SPLIT SPOON RC – ROCK CORE

BORING METHOD
HSA – HOLLOW STEM AUGER

ERT.
AN ENSR COMPANY -

SUBSURFACE EXPLORATION — LITHOLOGIC LOG OF B-MW-1

Client : THOMSON & NELSON
Project Name : OMEGA RECOVERY
Project Location : WHITTIER, CA
Job Number : 6715-002-200 Boring No : B-MW-1
Logged By : K. PITCHFORD, R.G.
Approved By :
Drilled By : INTERSTATE SOILS SAMPLING

DRILLING AND SAMPLING INFORMATION

Date Started : 6/11/88 Date Completed : 6/12/88
Method : HSA, 10-INCH Total Depth : 110 FEET

WELL COMPLETION INFORMATION

Screen Dia : 4-INCH Length : 10 FEET
Slot Size : 0.02-INCH Type : MILL SLOT
Casing Dia : 4-INCH Length : 90 FEET

SURFACE ELEVATION : 210 FEET, U.S.G.S. WHITTIER, CA.

DEPTH IN FEET	DESCRIPTION	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	PID *	TIME	WATER LEVEL
	continued SILTY CLAYEY SAND (ML)/SILTY SANDY CLAY (CL)		SS		50	90		
	slight increase in sand and fine gravel, including weathered rock fragments or clasts from 62 to 73 feet.							
65	becomes moist		SS			120	1230	
70		55	SS	1.5		140		6/11/88
75	SILTY CLAYEY SAND (SM/SC) light brown, with trace of weathered gravel, moist to very moist, no staining or odor		SS			5		▼
80			SS			4	240	
85			SS			2	315	
90			SS				400	
95								
100								
105								
110	Bottom of hole at 110 feet. Groundwater encountered at 75 feet.							
115	* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)							

SAMPLER TYPE
SS - DRIVEN SPLIT SPOON RC - ROCK CORE
ST - PRESSED SHELBY TUBE

BORING METHOD
HSA - HOLLOW STEM AUGER DC - DRIVING CASING

ERT.
AN ENSR COMPANY

SUBSURFACE EXPLORATION — LITHOLOGIC LOG OF B-MW-2

Client : THOMSON & NELSON
Project Name : OMEGA RECOVERY
Project Location : WHITTIER, CA
Job Number : 6715-002-200 Boring No : B-MW-2
Logged By : K. PITCHFORD, R.G.
Approved By :
Drilled By : INTERSTATE SOILS SAMPLING

DRILLING AND SAMPLING INFORMATION

Date Started : 6/11/88 Date Completed : 6/11/88
Method : HSA, 8-INCH Total Depth : 60 FEET

WELL COMPLETION INFORMATION

Screen Dia : Length :
Slot Size : Type :
Casing Dia : Length :

DESCRIPTION

SURFACE ELEVATION : 214 FEET, U.S.G.S. WHITTIER, CA.

DEPTH IN FEET	DESCRIPTION	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	PID *	TIME	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
0–7	2-inch Asphaltic concrete with 4-inch gravel base SILTY SAND (SM) light brown, dry, trace of fine gravel, no staining or odor									
5			SS		10	40				
7–22	QUATERNARY ALLUVIUM (Qal) SANDY CLAY (CL) dark brown, slightly moist, trace of fine to coarse gravel, no staining or odor									
10			SS		32	45	500			
15			SS		32	50				
20			SS		21	60				
22–57	SILTY CLAY (CL) dark brown, slightly moist, trace to minor fine sand, no staining or odor									
25			SS		43	75				
30		30	SS	1.5	58	85	530			
35			SS		39	70	545			
40			SS		24	60				
45			SS		44	105				
50		50	SS		58	100	600			
55			SS		64	90	615			
57–60	SILTY SAND (SM) medium brown, moist, low cohesion, trace clay, no staining or odor									
60			SS		32					

Bottom of hole at 60 feet.
No groundwater encountered.

* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)

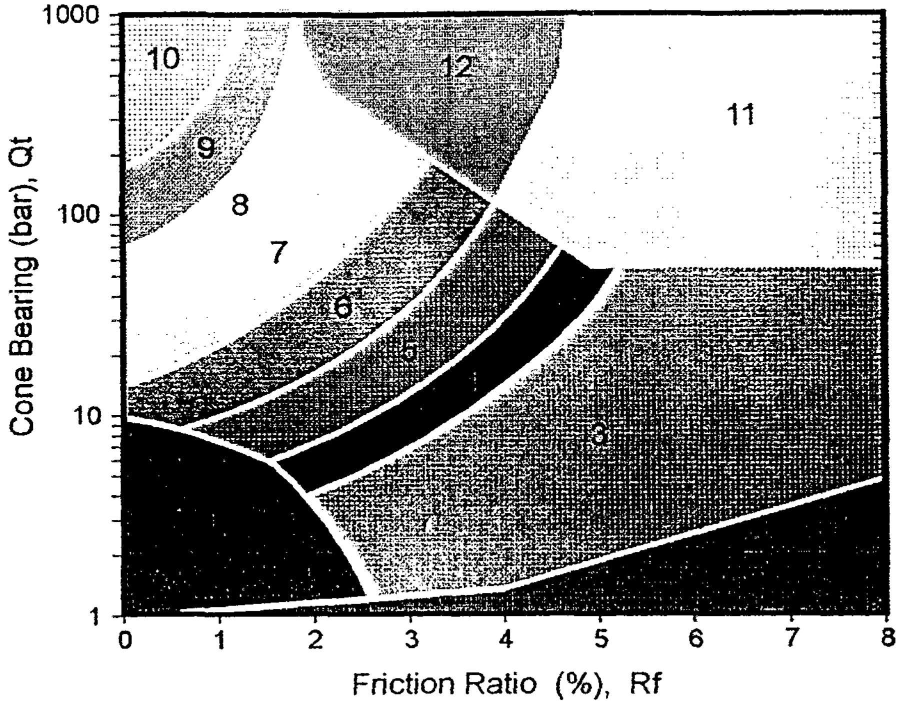
SAMPLER TYPE

SS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
RC – ROCK CORE
CT – CONTINUOUS TUBE

BORING METHOD

HSA – HOLLOW STEM AUGER
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

CPT Classification Chart
(after Robertson and Campanella, 1988)



Zone		Q_t / N	Soil Behaviour Type
1		2	sensitive fine grained
2		1	organic material
3		1	clay
4		1.5	silty clay to clay
5		2	clayey silt to silty clay
6		2.5	sandy silt to clayey silt
7		3	silty sand to sandy silt
8		4	sand to silty sand
9		5	sand
10		6	gravelly sand to sand
11		1	very stiff fine grained *
12		2	sand to clayey sand *

* overconsolidated or cemented

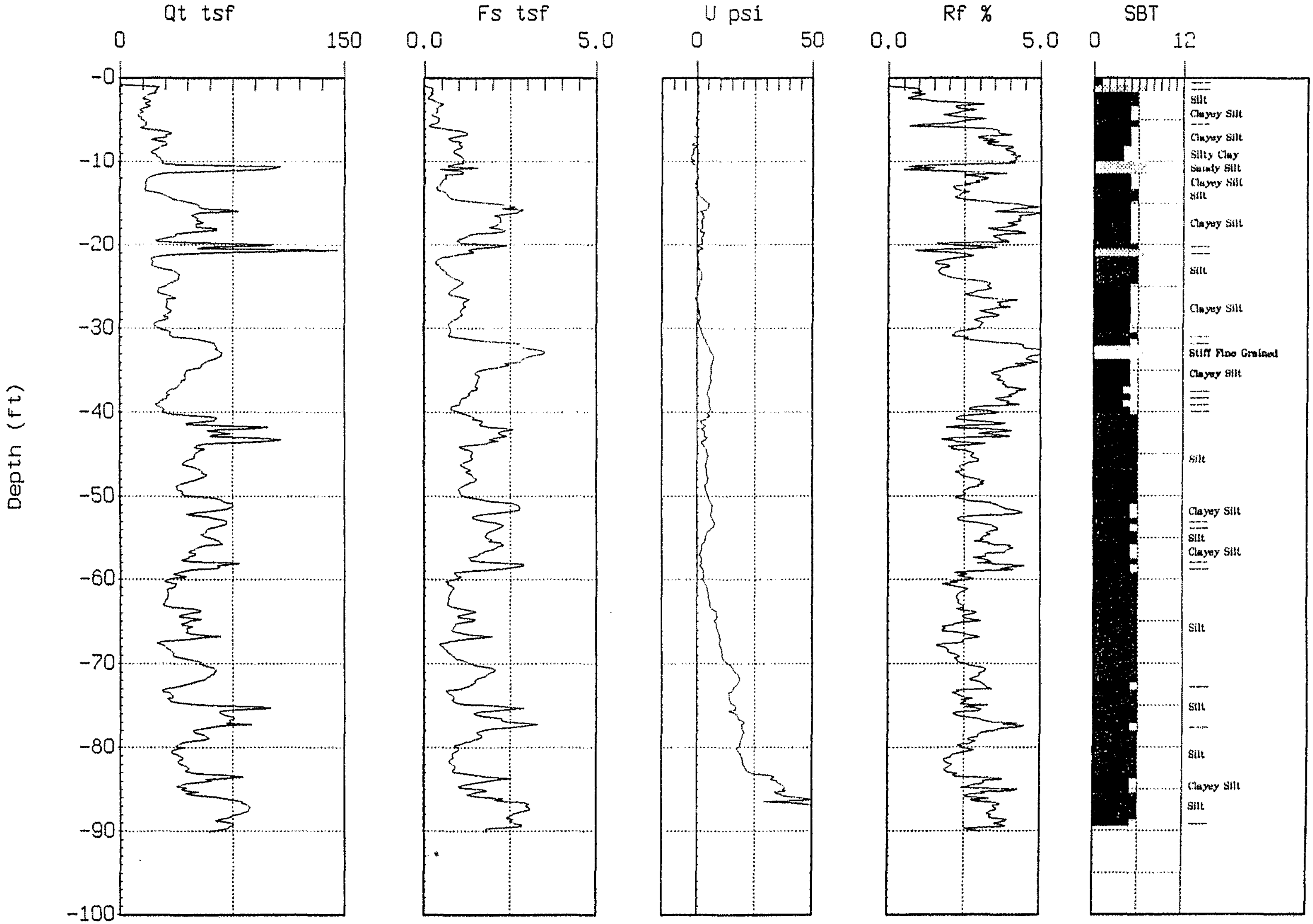
GREGG

GREGG

ENGLAND/HARGIS

Site: OMEGA CHEM.
Location : H-1

Geologist : GREG CRANHAN
Date : 01:29:96 14:35



Max. Depth: 90.06 (ft)

Depth Inc.: 0.164 (ft)

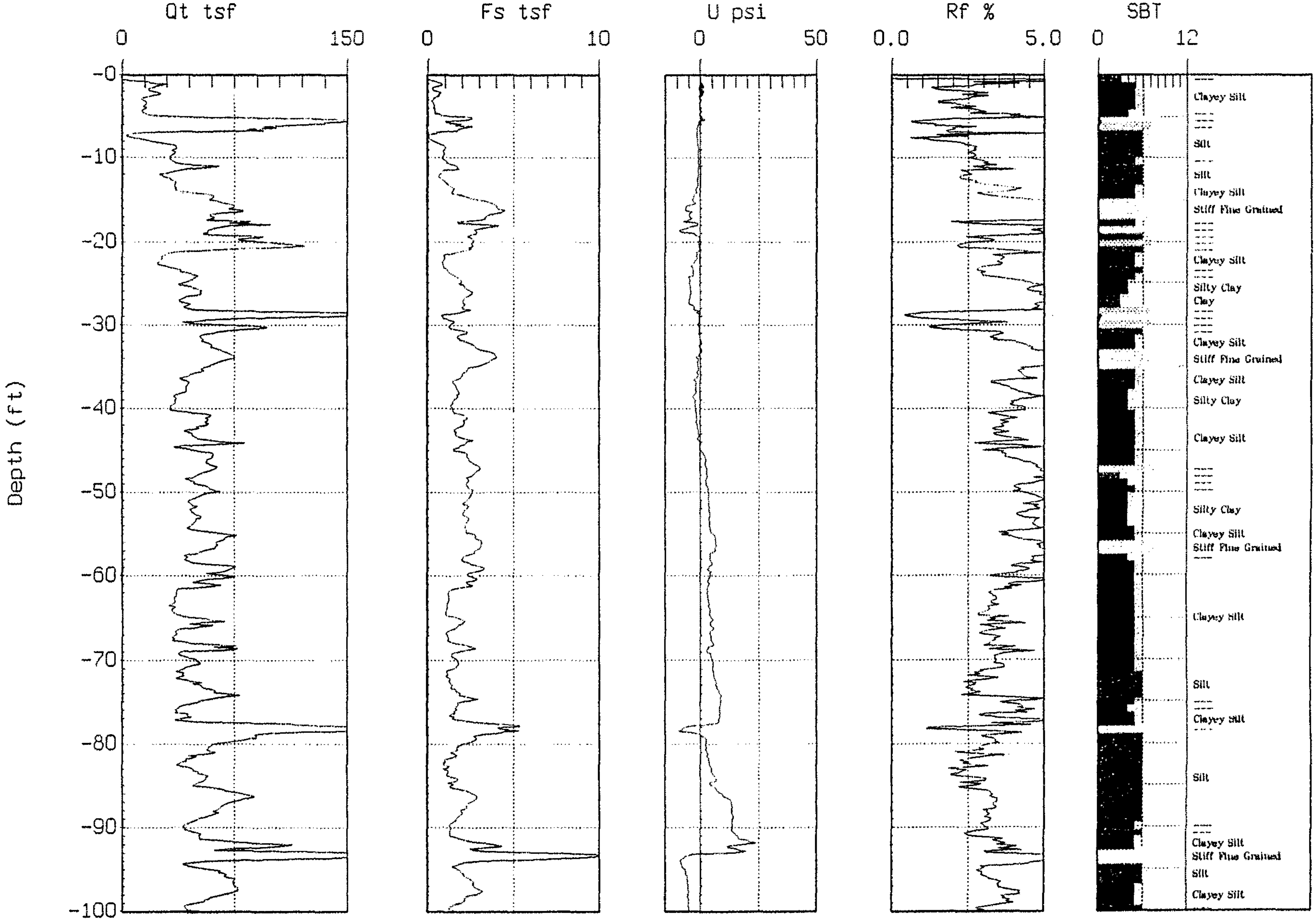
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ENGLAND/HARGIS

Site: OMEGA CHEMICALS
Location : H-2

Geologist : GREG CRANHAN
Date : 01:30:96 08:00



Max. Depth: 123.85 (ft)

Depth Inc.: 0.164 (ft)

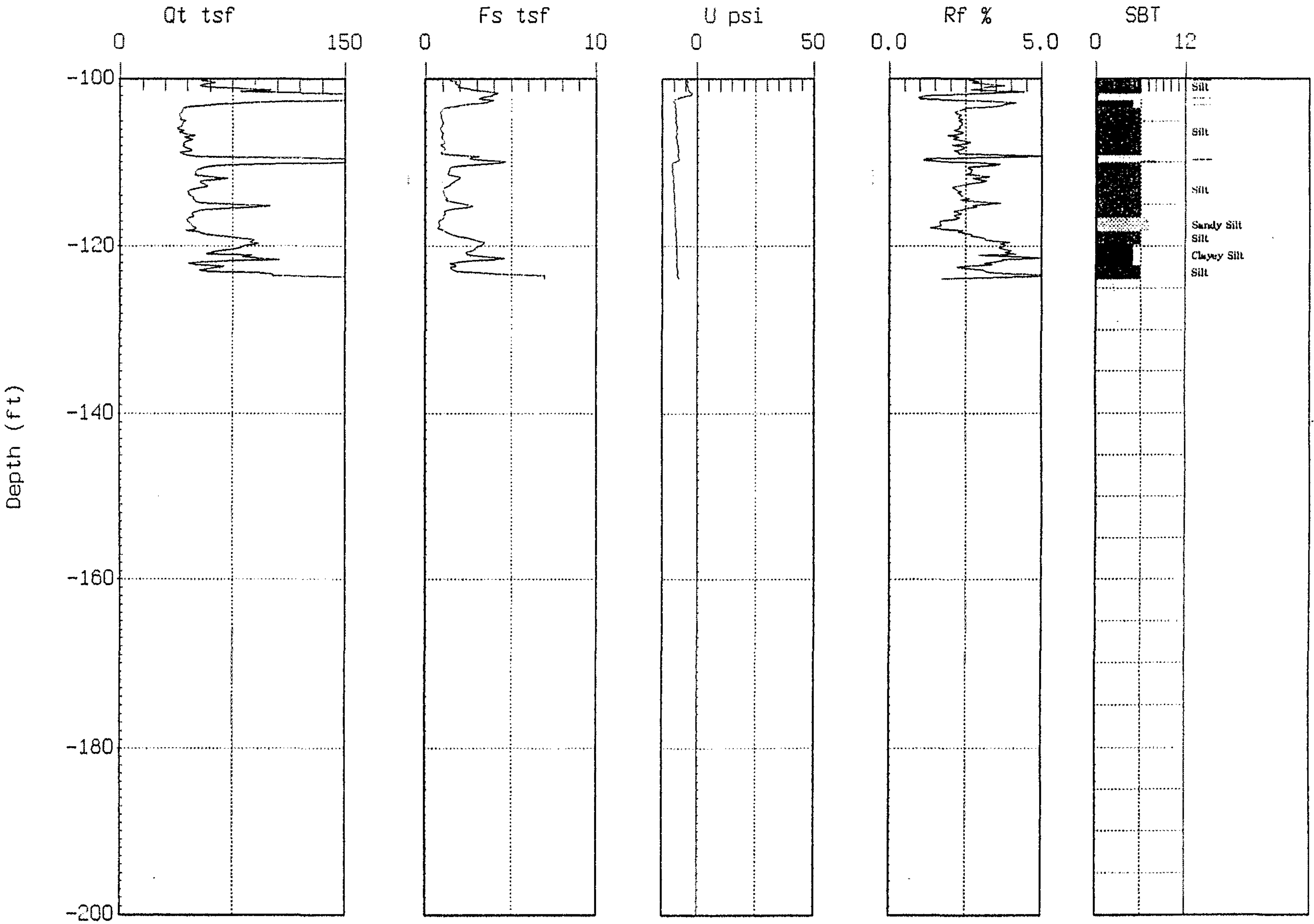
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ENGLAND/HARGIS

Site: OMEGA CHEMICALS
Location : H-2

Geologist : GREG CRANHAN
Date : 01:30:96 08:00

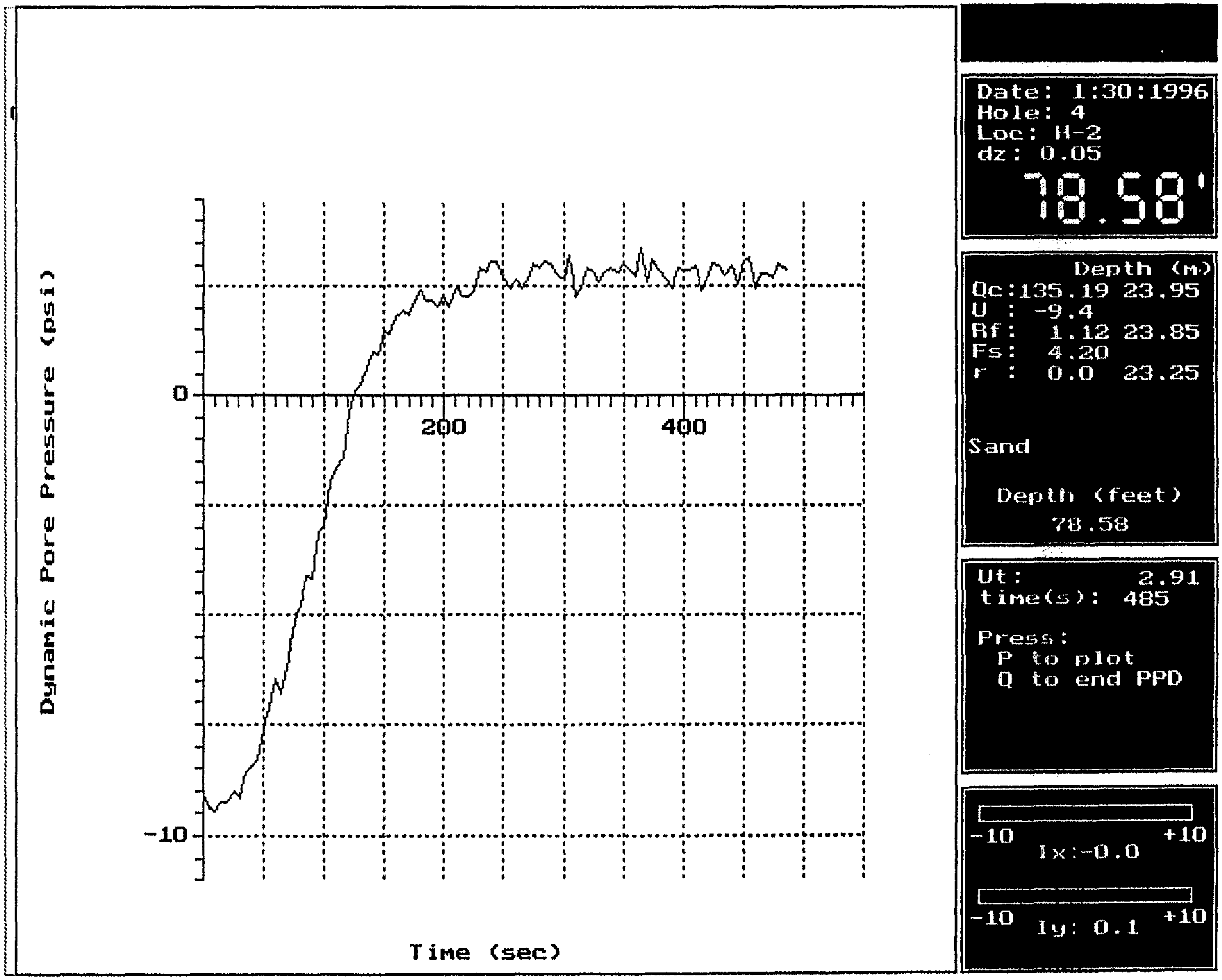


Max. Depth: 123.85 (ft)

Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

2.7 3.0 3.0 2.8 3.0 2.6 3.1 3.2 2.5 2.8 2.8 2

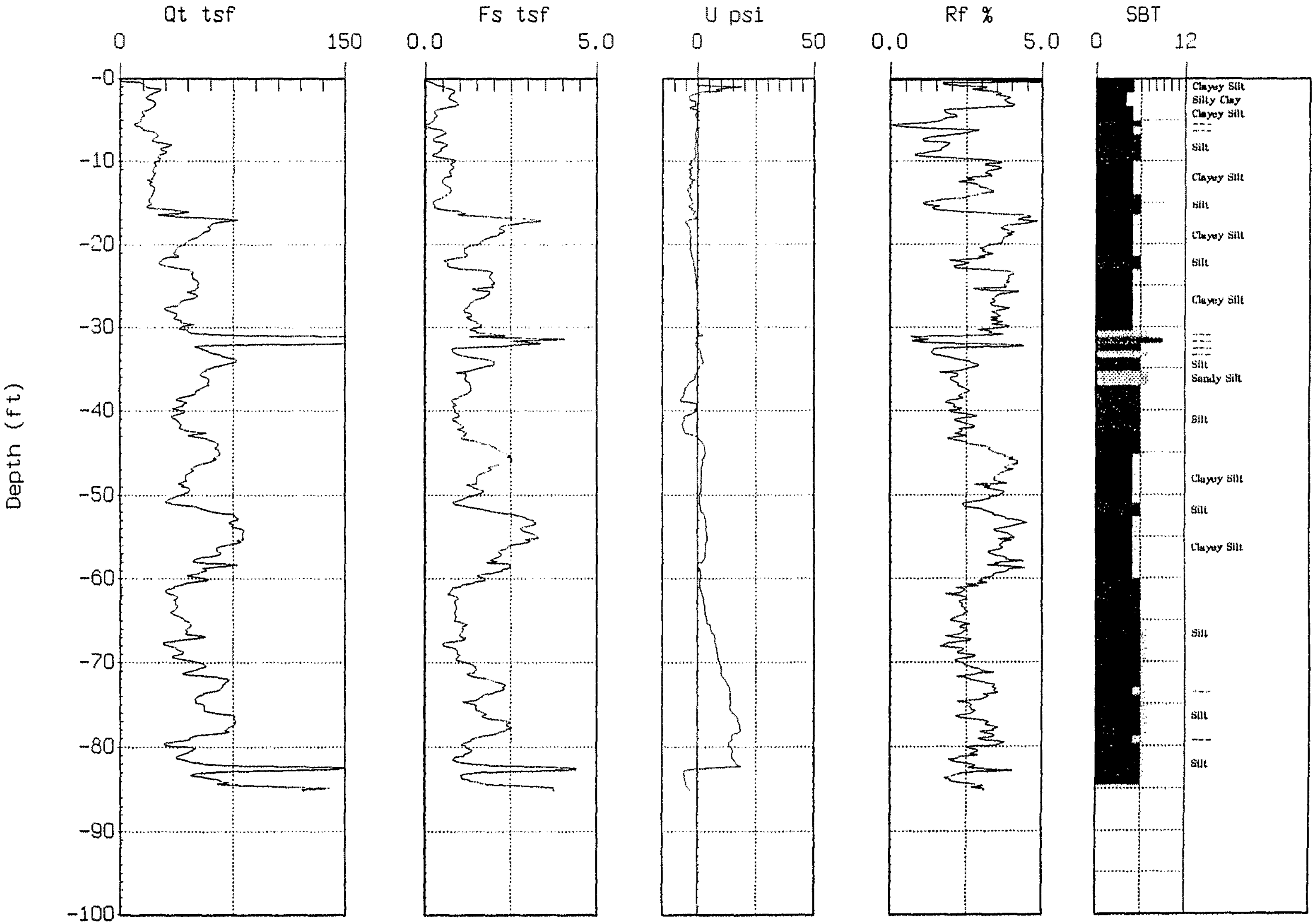


GREGG

ENGLAND/HARGIS

Site: OMEGA CHEM.
Location : H-3

Geologist : GREG CRANHAN
Date : 01:29:96 09:03



Max. Depth: 85.14 (ft)

Depth Inc.: 0.164 (ft)

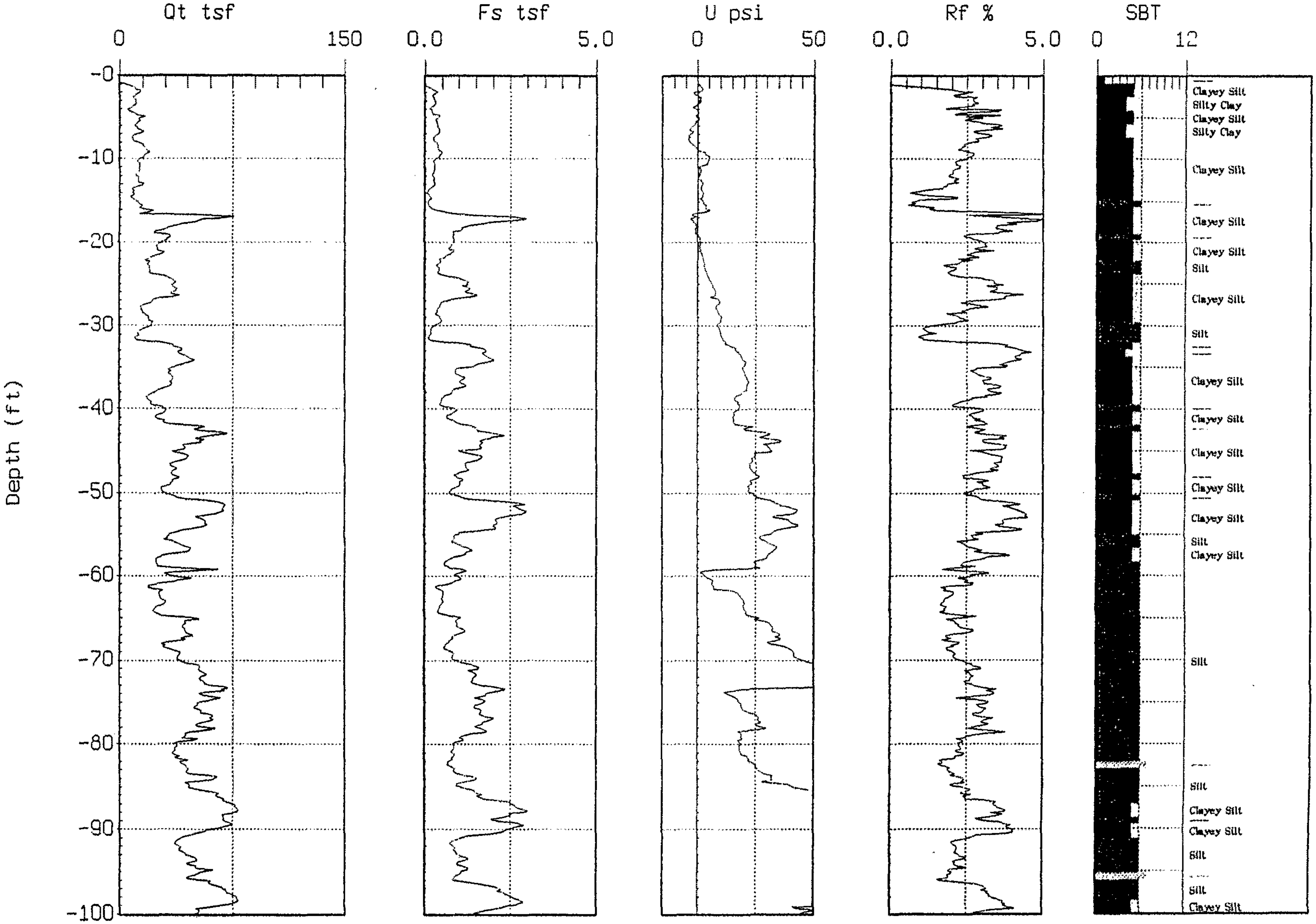
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ENGLAND/HARGIS

Site: OMEGA CHEM.
Location : H-4

Geologist : GREG CRANHAN
Date : 01:29:96 11:33



Max. Depth: 101.05 (ft)

Depth Inc.: 0.164 (ft)

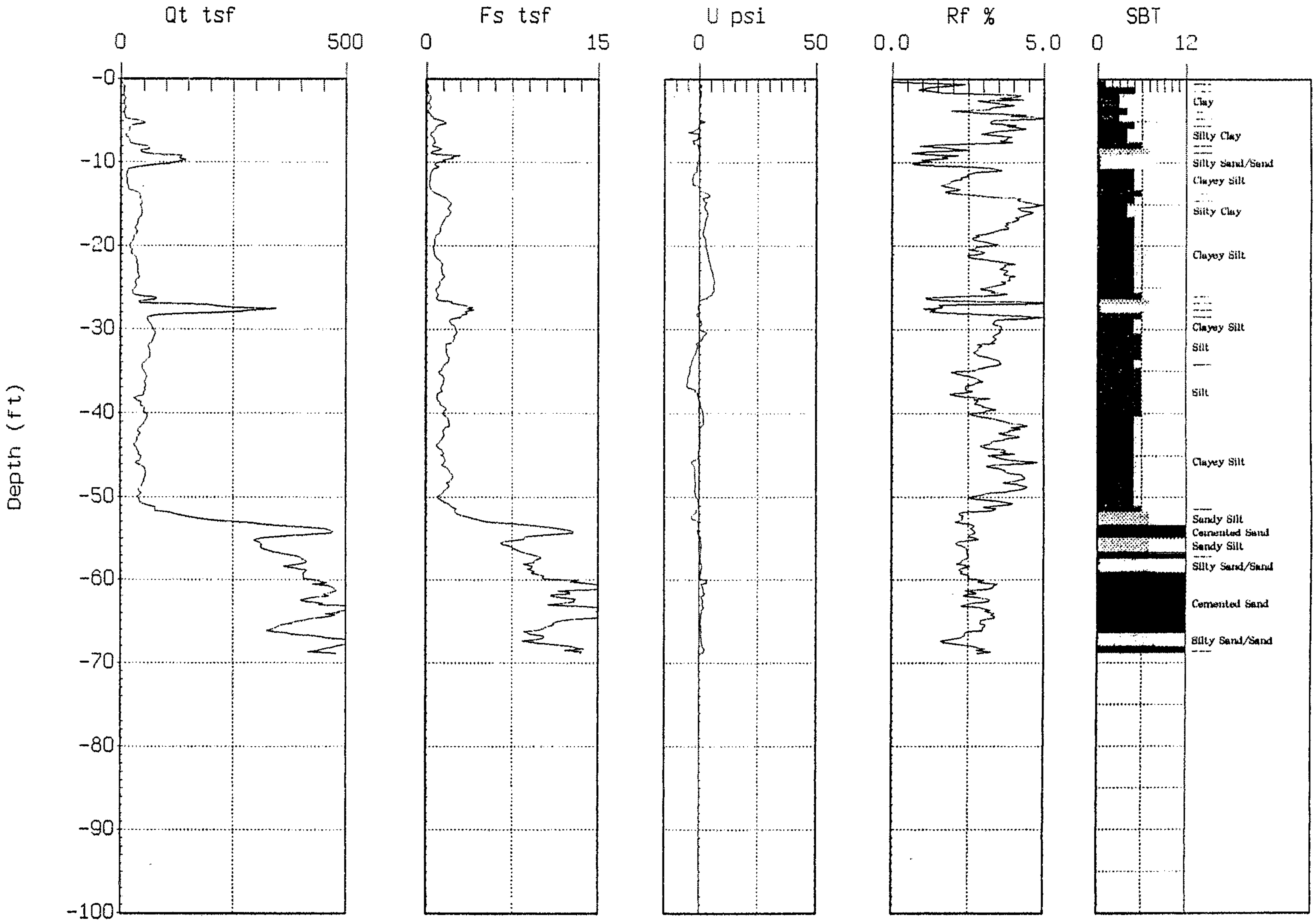
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ENGLAND/HARGIS

Site: OMEGA CHEMICALS
Location : H-5

Geologist : GREG CRANAHAN
Date : 01:31:96 08:09



Max. Depth: 68.90 (ft)

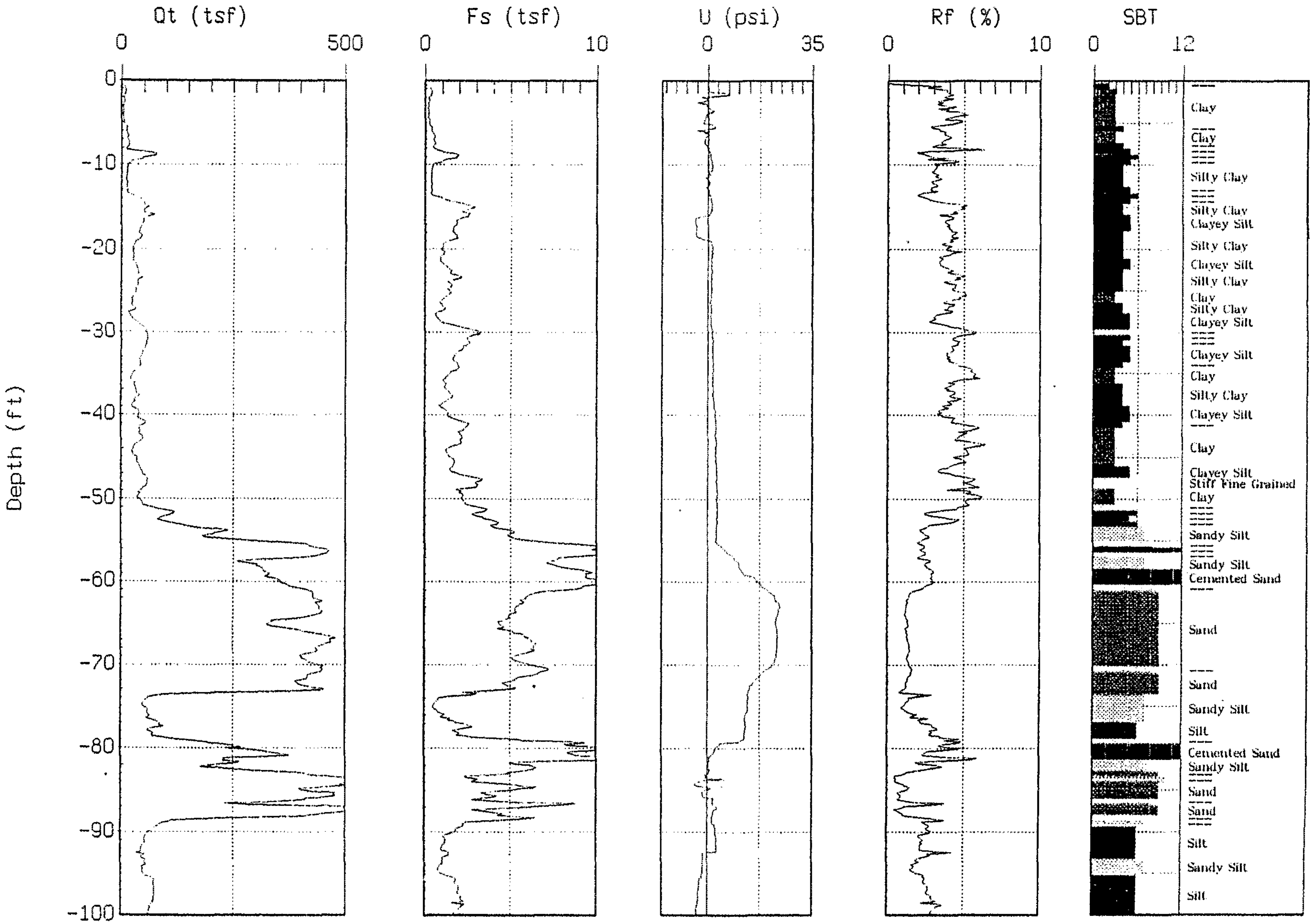
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ENGLAND/HARGIS

Project : OMEGA CHEMICAL
Location : H-6
Geologist : GREG CR[illegible]
Date : 07:15:96 07:4[illegible]



Max. Depth: 115.65 (ft)

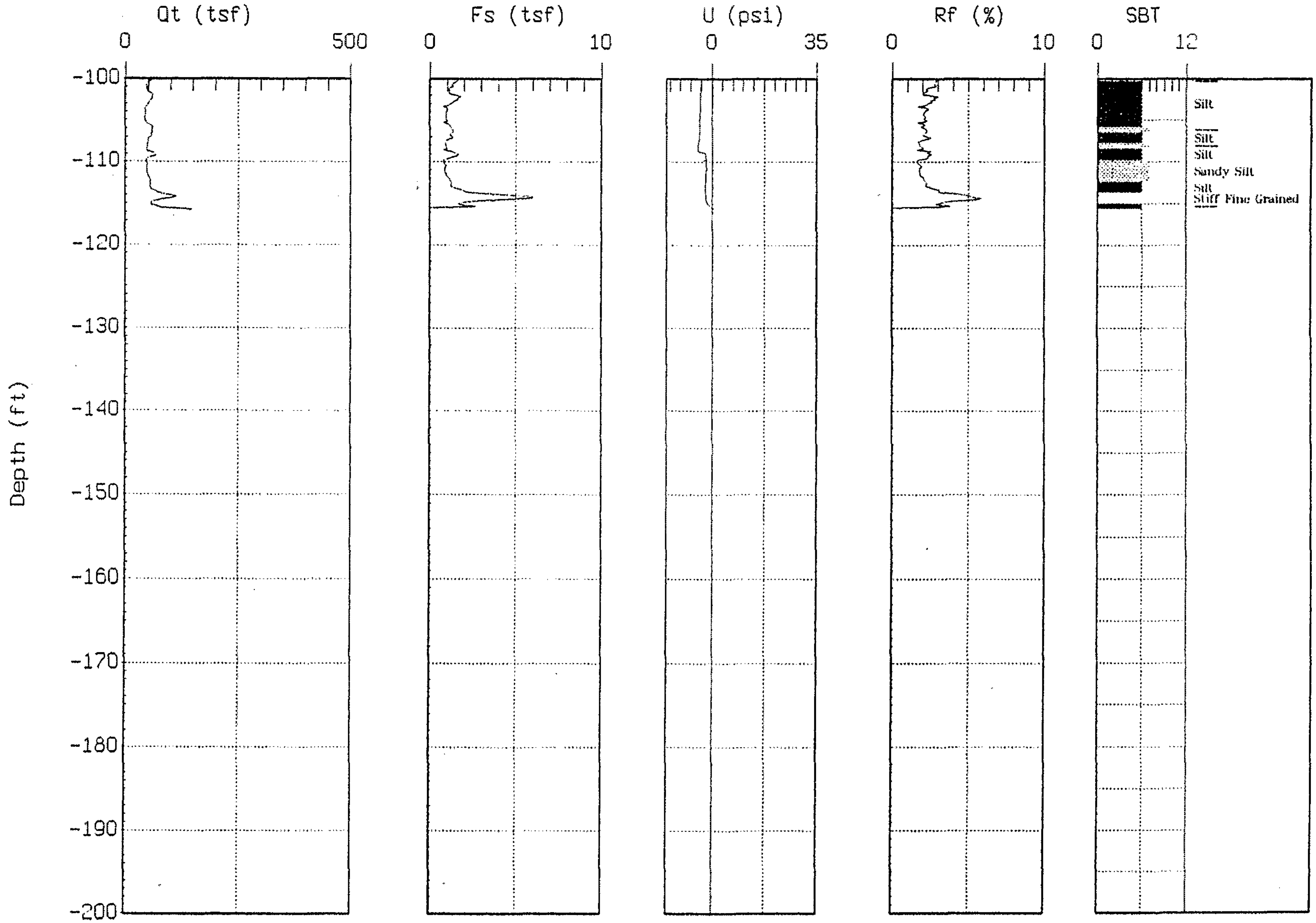
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ENGLAND/HARGIS

Project : OMEGA CHEMICAL
Location : H-6

Geologist : GREG CRANHAN
Date : 07:15:96 07:46



Max. Depth: 115.65 (ft)

Depth Inc.: 0.164 (ft)

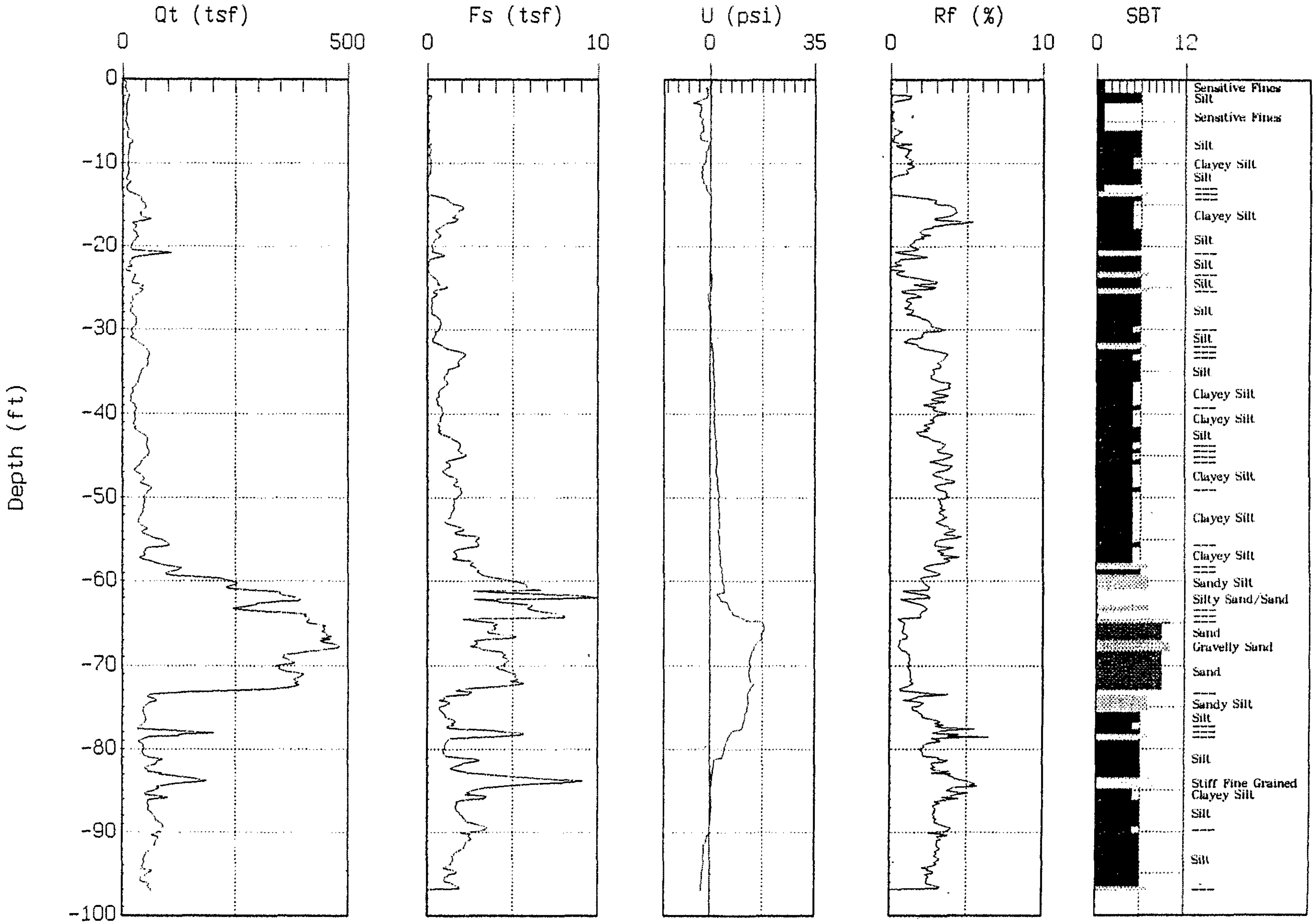
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ENGLAND/HARGIS

Project : OMEGA CHEMICALS
Location : H-7

Geologist : G. CRANHAM
Date : 07:15:96 15:34



Max. Depth: 97.11 (ft)

Depth Inc.: 0.164 (ft)

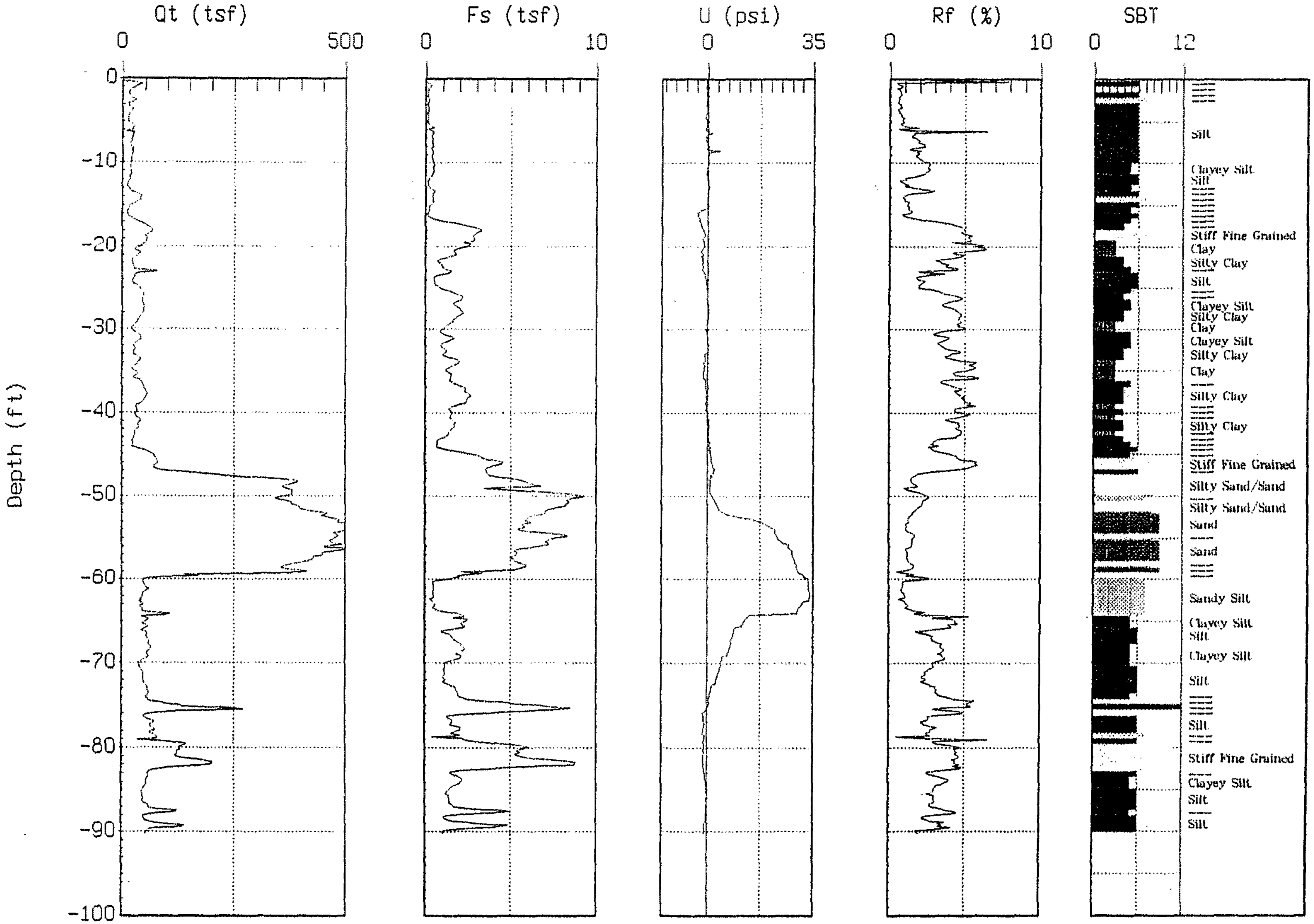
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ENGLAND/HARGIS

Project : OMEGA CHEMICAL
Location : H-8

Geologist : GREG CRANHAM
Date : 07:16:96 08:45



Max. Depth: 90.22 (ft)

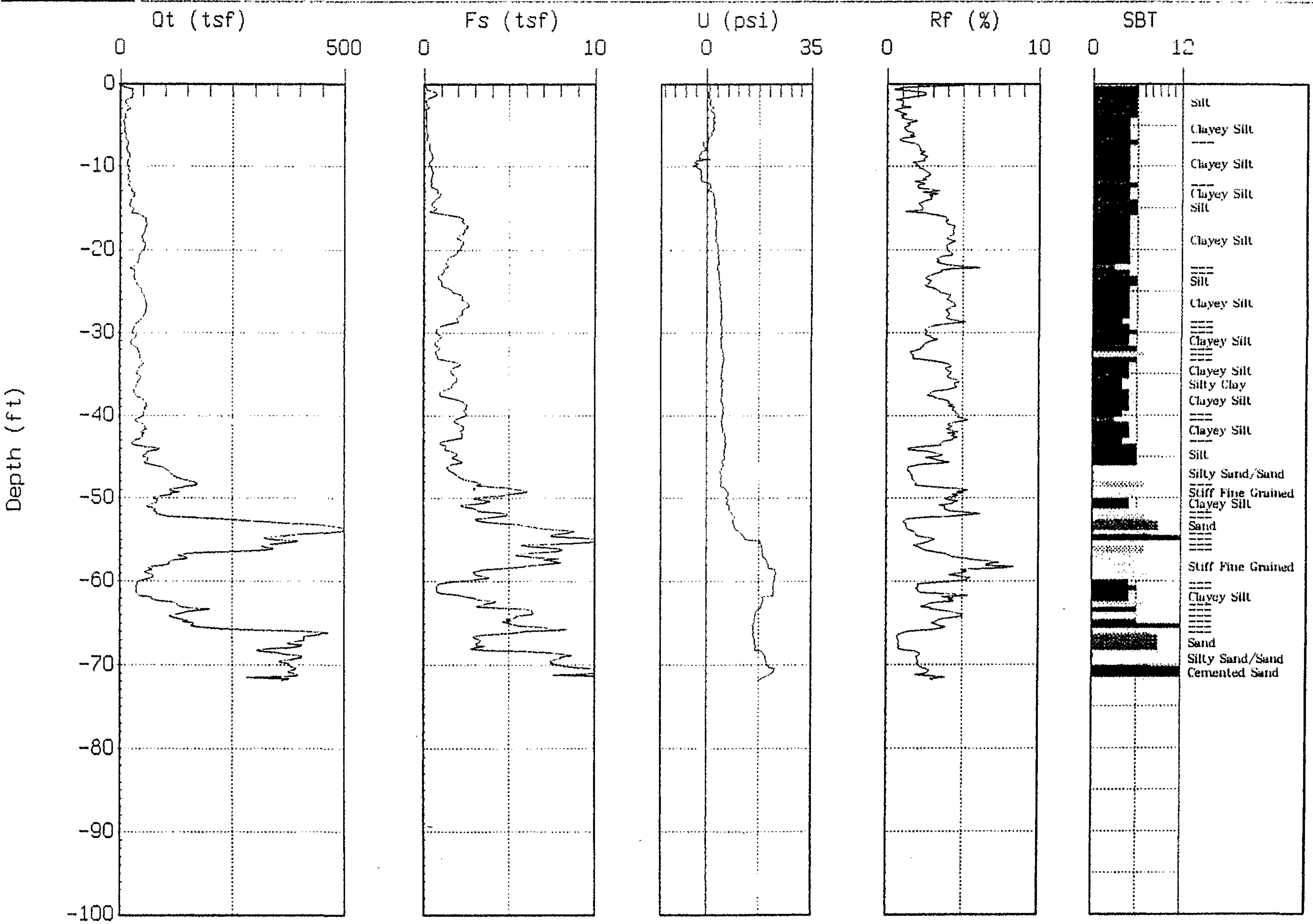
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ENGLAND/HARGIS

Project : OMEGA CHEMICAL
Location : H-9

Geologist : GREG CRANHAM
Date : 07:16:96 12:05



Max. Depth: 71.85 (ft)

Depth Inc.: 0.164 (ft)

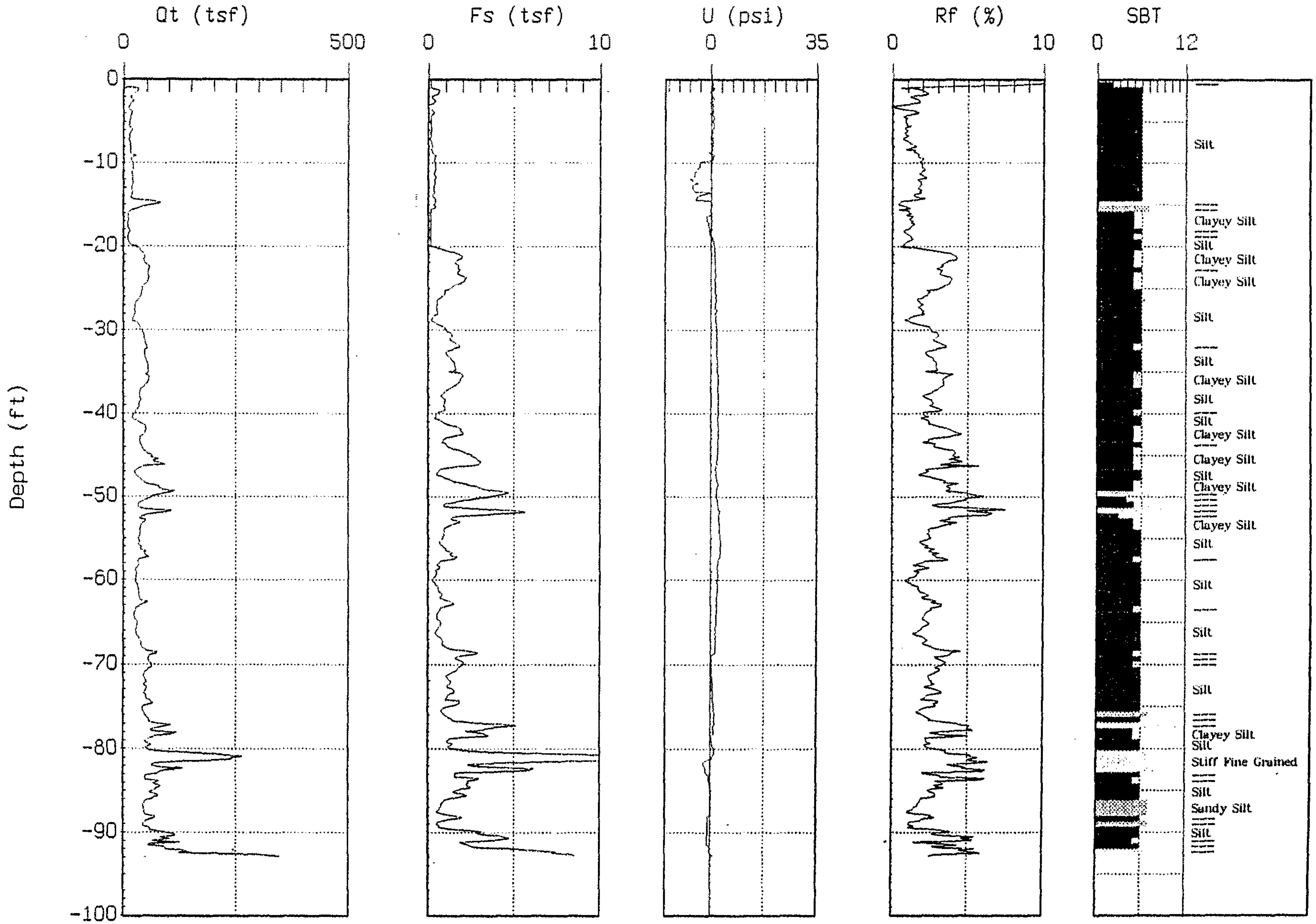
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ENGLAND/HARGIS

Project : OMEGA CHEMICAL
Location : H-10

Geologist : GREG CRANHAM
Date : 07:16:96 14:22



Max. Depth: 92.85 (ft)

Depth Inc.: 0.164 (ft)

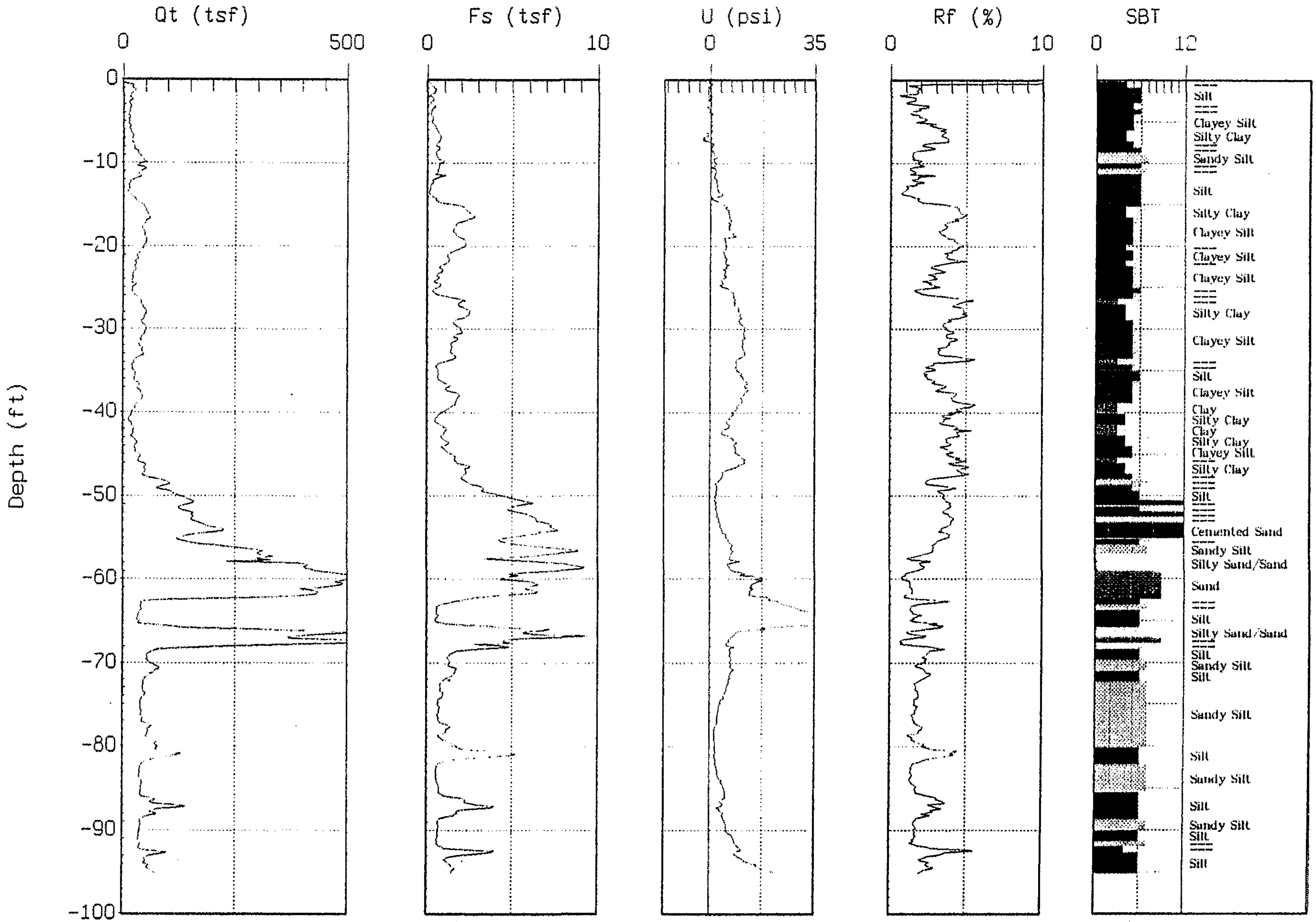
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ENGLAND/HARGIS

Project : OMEGA CHEMICAL
Location : H-11

Geologist : GREG CRANHAM
Date : 07:17:96 07:35



Max. Depth: 95.14 (ft)

Depth Inc.: 0.164 (ft)

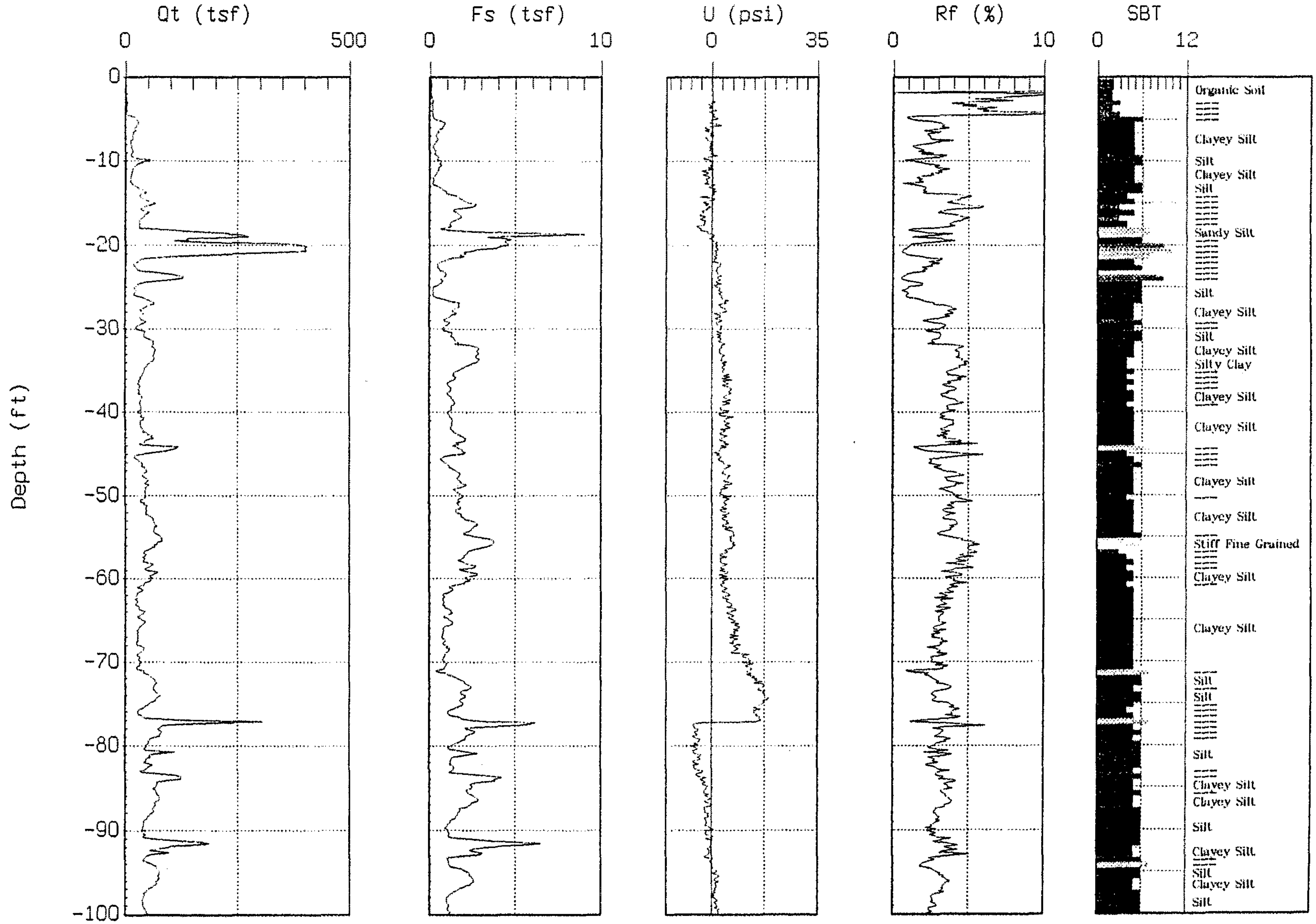
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ENGLAND/HARGIS

Project : OMEGA CHEMICAL
Location : H-12B

Geologist : GREG CRANHAM
Date : 07:19:96 13:45



Max. Depth: 122.37 (ft)

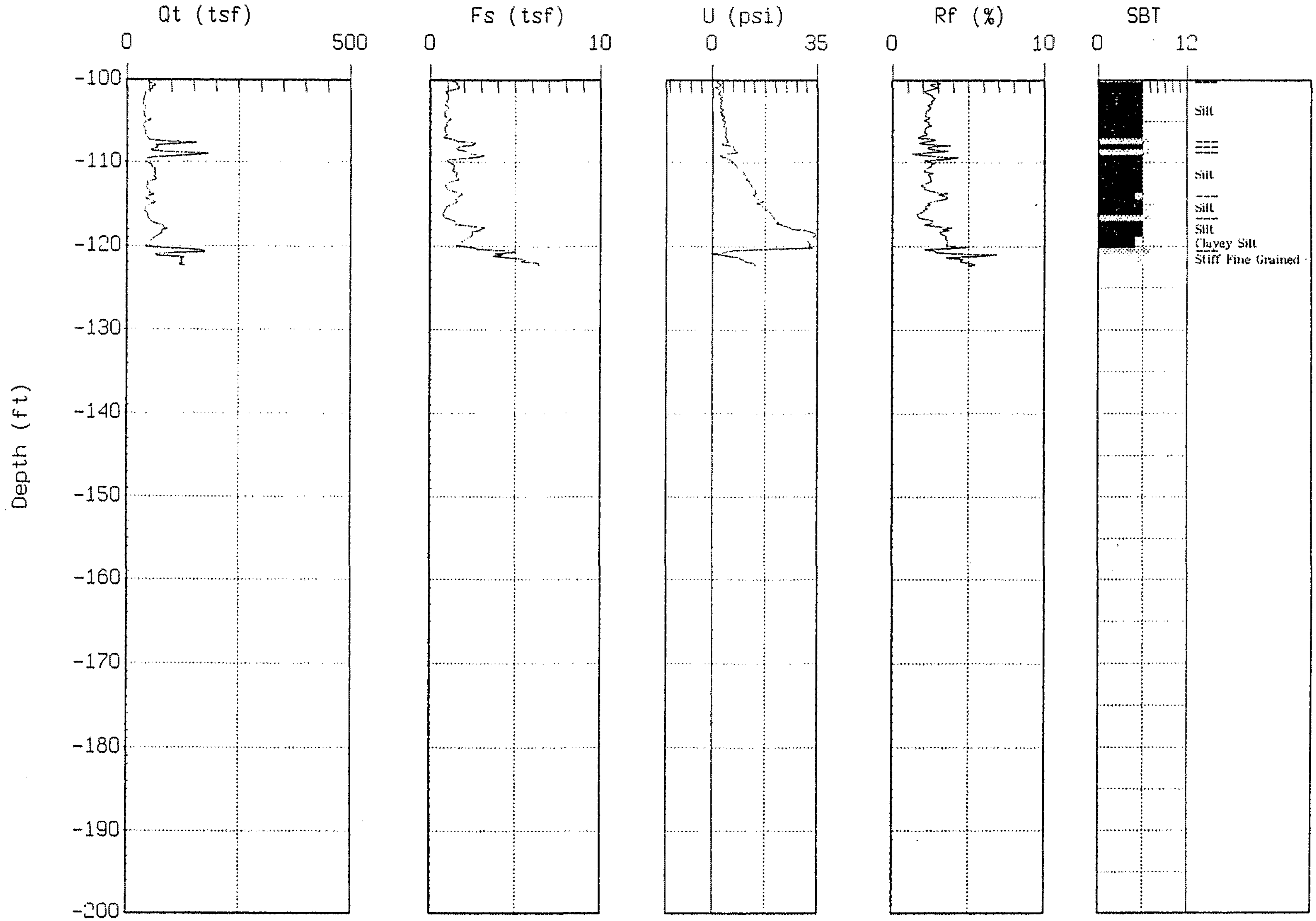
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ENGLAND/HARGIS

Project : OMEGA CHEMICAL
Location : H-12B

Geologist : GREG CRANHAM
Date : 07:19:96 13:45



Max. Depth: 122.37 (ft)

Depth Inc.: 0.164 (ft)

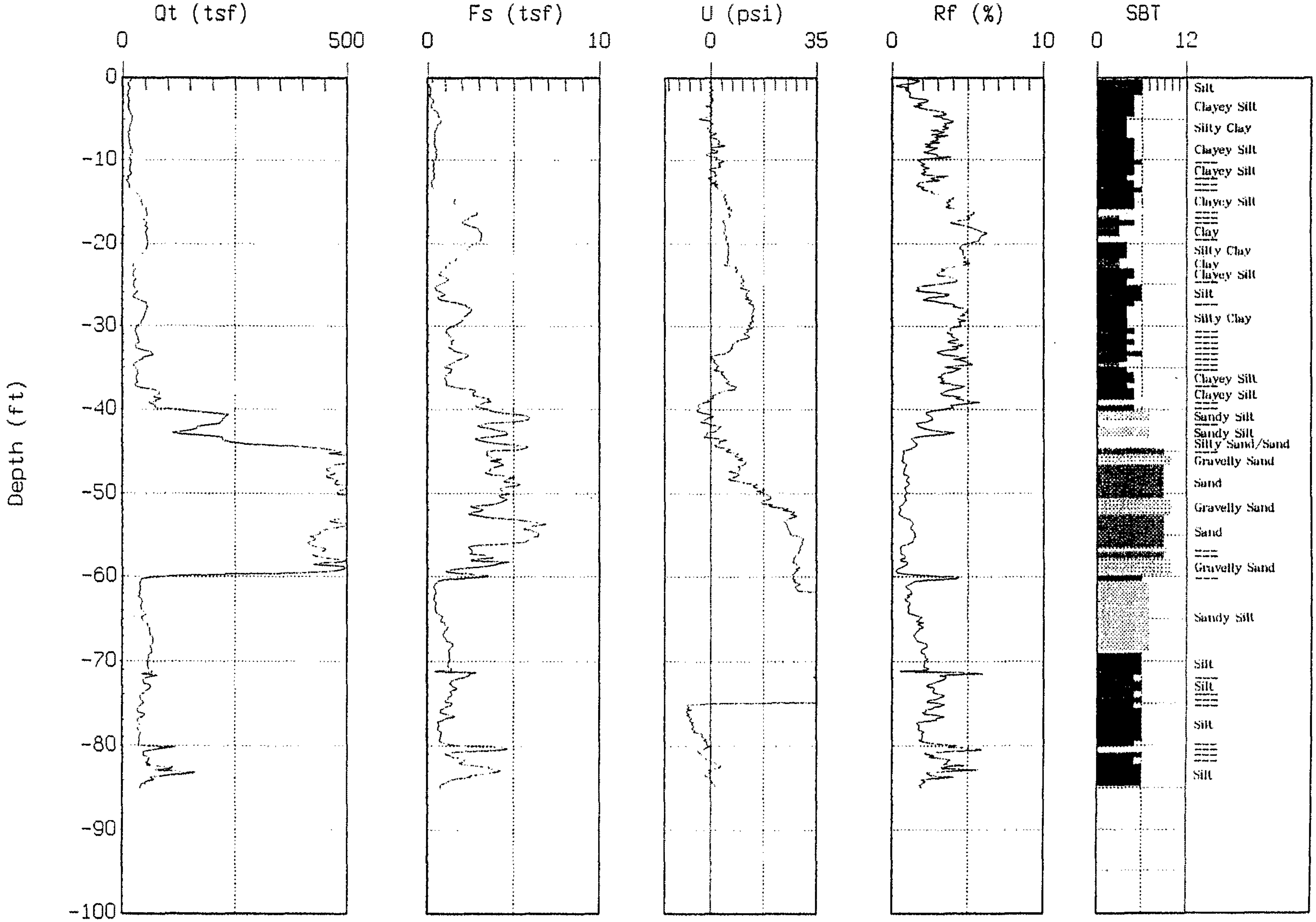
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ENGLAND/HARGIS

Project : OMEGA CHEMICAL
Location : H-13

Geologist : GREG CRANHAM
Date : 07:19:96 08:28



Max. Depth: 84.97 (ft)

Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

TABLE 1 - SUMMARY OF CONE PENETRATION TESTING

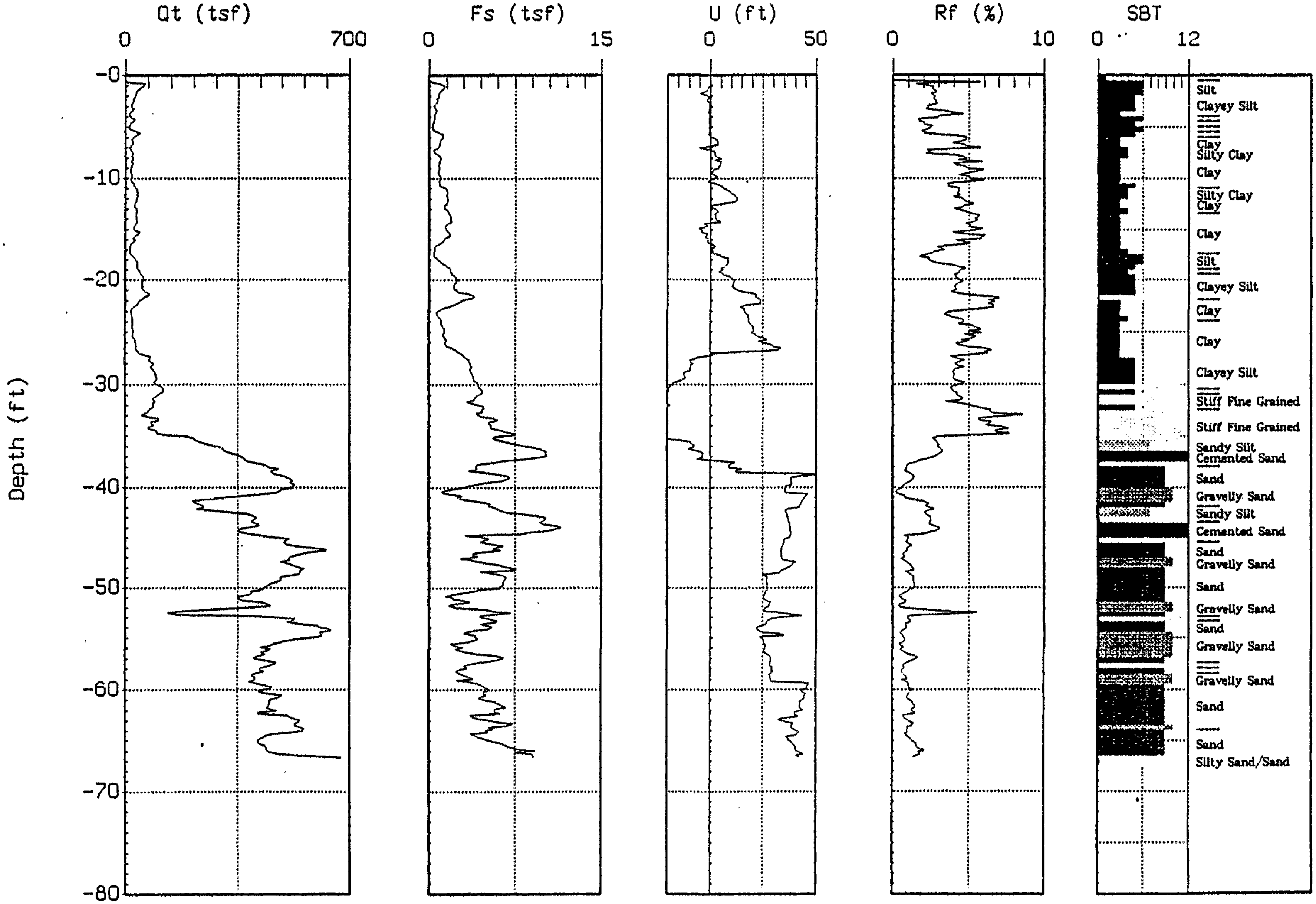
LOCATION	MAX DEPTH (ft)
H-6	115.65
H-7	97.11
H-8	90.22
H-9	71.85
H-10	92.85
H-11	95.14
H-12B	122.37
H-13	84.97

GREGG

C2REM

Site : OMEGA CHEMICALS
Location : CPT-H14

Engineer L. GATES
Date : 03:11:97 08:03



Max. Depth: 66.60 (ft)

Depth Inc.: 0.164 (ft)

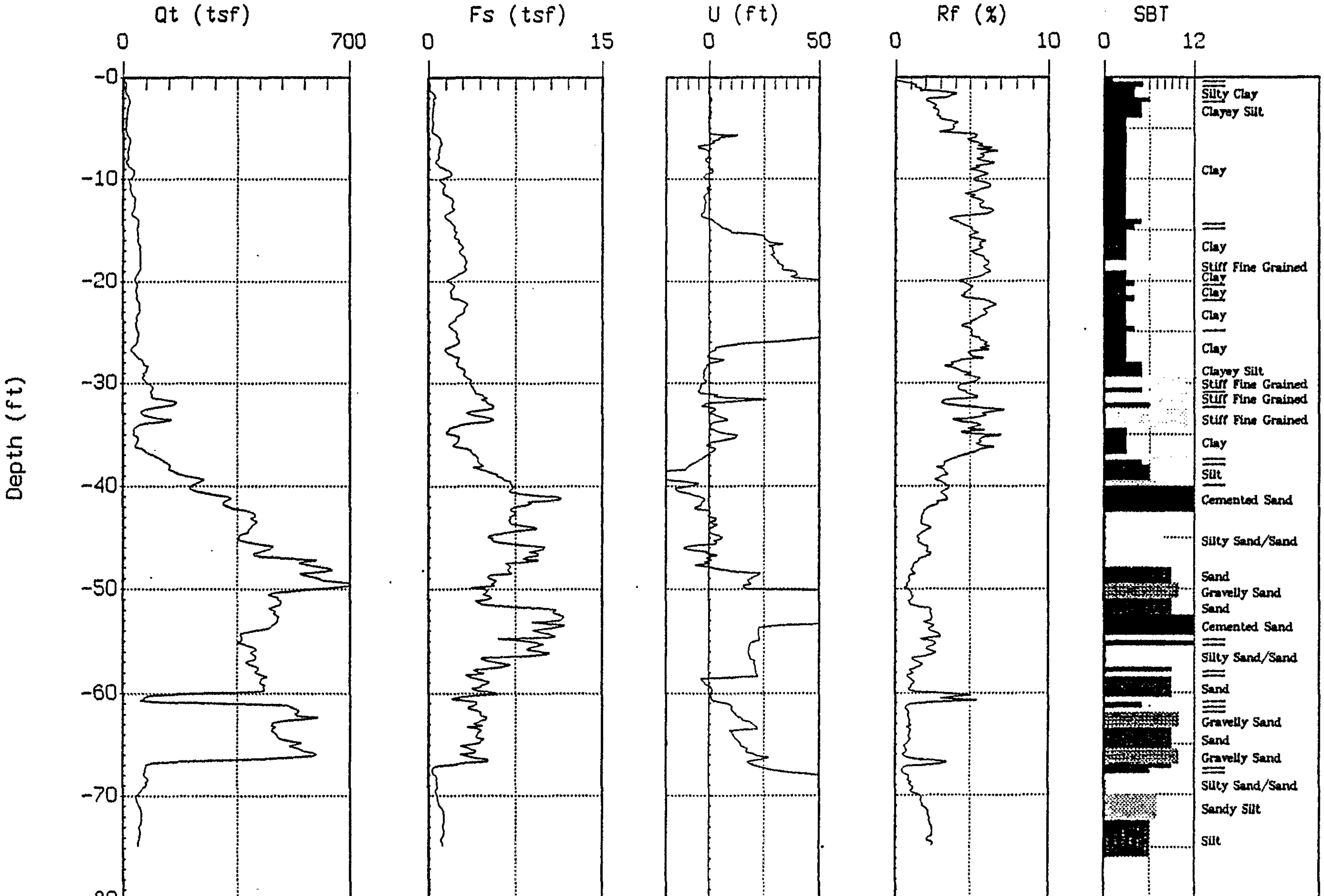
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

C2REM

Site : OMEGA CHEMICALS
Location : CPT-H15

Engineer L. GATES
Date : 03:11:97 13:59



Max. Depth: 74.80 (ft)

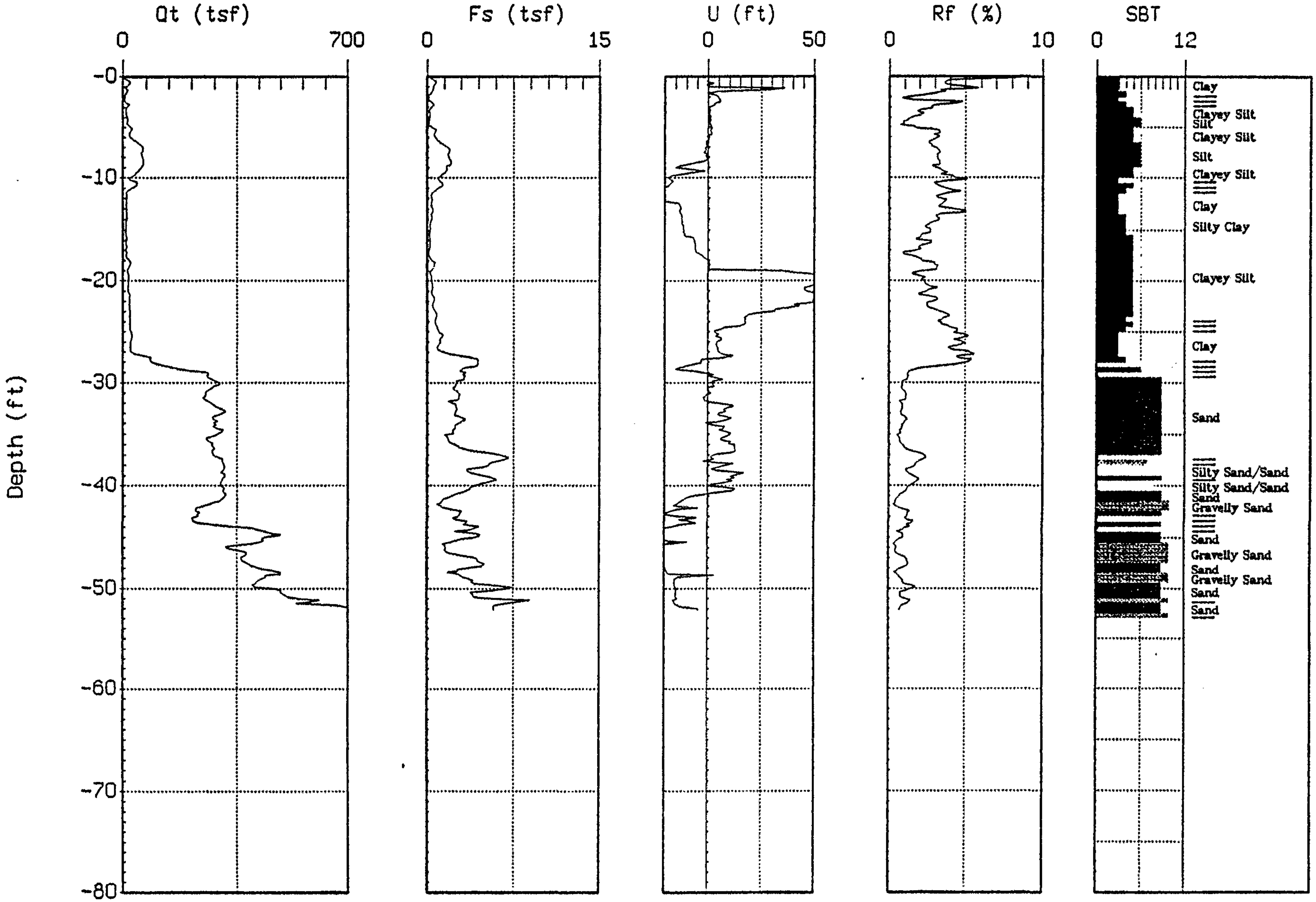
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

C2REM

Site : OMEGA CHEMICALS
Location : CPT-H16

Engineer L. GATES
Date : 03:11:97 16:05



Max. Depth: 52.16 (ft)

Depth Inc.: 0.164 (ft)

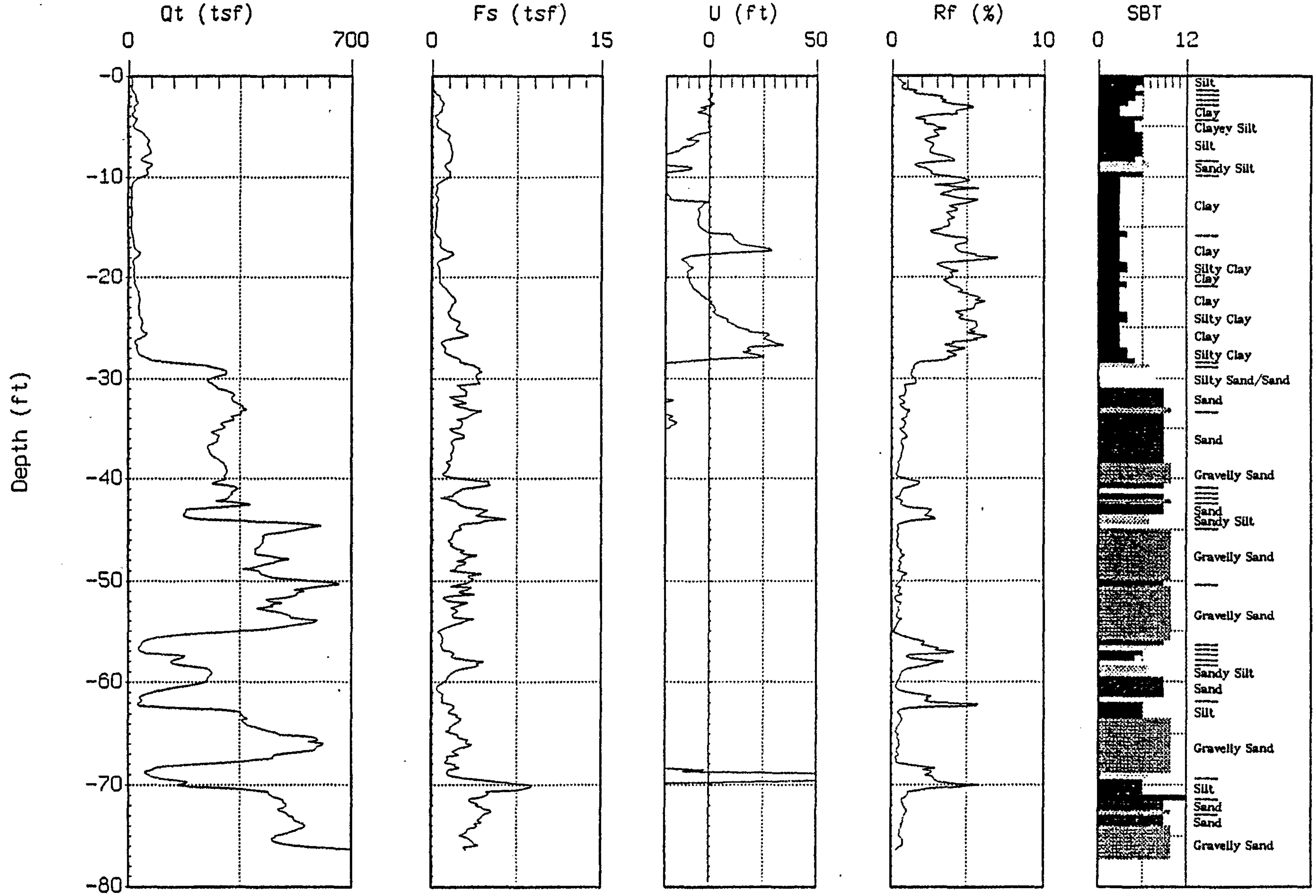
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

C2REM

Site : OMEGA CHEMICALS
Location : CPT-H17

Engineer L. GATES
Date : 03:12:97 09:27



Max. Depth: 76.44 (ft)

Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

SOIL BORING: B-4

DATE DRILLED: 5/23/96	SURFACE ELEVATION: 208 feet msl
BOREHOLE DIA.: 6-inch	TOTAL DEPTH OF BORING: 75 feet bls
DRILLING COMPANY: Gregg Drilling, Inc.	METHOD: Hollow Stem Auger
DRILLER'S NAME: T. Rider	DRILL RIG: Rhino Limited Access
LOGGED BY: G. Cranham (R.G.#5897)	CHECKED BY: M. Palmer (R.G.# 5915)

PROJECT NAME: Omega

PROJECT NUMBER: 445.02

LOCATION: See Figure 1.

COMMENTS: Sampler: 1⅜-inch SPT & 2-inch by 18-inch Modifed California sampler.
Weather: Partly cloudy, wind 0-2 mph variable, cool.

DEPTH (feet)	RECOVERY %	USCS	LITHOLOGIC DESCRIPTION OF MATERIAL
0			Concrete Slab
1–5	90	CH	Silty Clay, very dark gray (5 YR 3/1), moist, high plasticity, medium toughness, firm, medium dry strength; trace sand.
5–8.5	33	ML	Sandy Silt (55% silt, 40% sand, 5% clay), yellowish brown (10 YR 5/4), moist, firm, low plasticity, sand very fine-grained, well sorted, low toughness, carbonate pore fillings are common, high dry strength; trace clay [6.5-7': UV-no]
8.5–10	100	CH / ML	Silty Clay, same as 0.3 to 5 feet, firm to stiff, subrounded pebble (granitic) at 8.7 feet, thin layer of silt at 8.9 feet (0.05 foot thick, same as 5 to 8.5 feet) [8.5-9': UV-no]
10–14	100 100 100	ML	Silt with Sand, yellowish brown (10 YR 5/4), moist, soft to firm (crumbly), low plasticity, medium dry strength, low toughness, some carbonate pore fillings; sand very fine. Small subangular pebble at 11 feet (Probable fine sandstone). [10-11.5': UV-no; Dye-no reaction] [11.5-13': UV-no; OVA-100 ppm] [13.5-14': OVA-150 ppm]
14–18.5	67 100	CH	Clay, brown (10 YR 4/3), moist, very stiff, medium to high plasticity, medium toughness, high dry strength; trace silt, trace sand, occasional pebbles [15-16.5': UV-no] Stiff at 17 to 17.5 feet. [17-18.5': UV-no; Dye-no reaction; minor fluorescent mineral at ~18']

RPT NO.

SHEET 1 OF 4

FIGURE B-2. LITHOLOGIC LOG FOR SOIL BORING B-4

399-A\2062\LOG2\06/20/96

PROJECT NAME: Omega

PROJECT NUMBER: 445.02

DATE DRILLED: 5/23/96

SOIL BORING: B-4

DEPTH (feet)	SAMPLE	RECOVERY %	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION OF MATERIAL
			CH		Pebble at 18 feet [18.5-19': UV-no; OVA-12.5 ppm]
19		100			Increased silt content, stiff at 18.5 to 18.8 feet Very dark gray clay at 18.8 to 19 feet (Same as 0.3 to 5 feet)
20		100	SM		Silty Sand (55% sand, 40% Silt, ~5% clay), dark yellowish brown (10 YR 4/4), moist, medium dense, nonplastic, fine to very fine, trace medium and coarse, well sorted, subangular; trace clay, trace gravel
21			CH		[20-21.5': UV-no; Dye-no reaction; OVA-120 ppm]
22		100			Clay (same as 14 to 20 feet) Thin layer of clay with sand, medium to coarse (21.5 to 21.6 feet) [21.5-23': UV-no; OVA-55 ppm]
23					
24		100			
25		100			[25-26.5': UV-no; Dye-no reaction] 25.6 to 25.8 feet, thin layer of Clay with Sand, (same as 21.5 to 21.6 feet).
26					[26.5-28': UV-no]
27		100			
			ML		Silt with Sand, (same as 9 to 14 feet) stiff 27.8 to 27.9 feet, thin layer of Clay with Sand (same as 21.5 to 21.6 feet)
28					
29		100			
30		100			[30': OVA-70 ppm] [30-31.5': UV-no; Dye-no reaction]
31			CH		Clay (same as 14 to 20 feet). [31.5-33': UV-no; OVA-90 ppm]
32		100			
33					
34		100			
35		100			[35': OVA-100 ppm] [35-36.5': UV-no; Dye-no reaction]
36					[36.5-38': UV-no; OVA-150 ppm]
37		100			
38			ML		Silt with Sand (same as 9 to 14 feet). [38.5-39.5': UV-no; OVA-150 ppm]
		100			

RPT NO.

FIGURE B-2. LITHOLOGIC LOG FOR SOIL BORING B-4

399-A\2. .063\06/20/96

SOIL BORING: B-4

PROJECT NAME: Omega

PROJECT NUMBER: 445.02

DATE DRILLED: 5/23/96

DEPTH (feet)	SAMPLE	RECOVERY %	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION OF MATERIAL
			ML		
40		100	CH		Clay (same as 14 to 20 feet). [40–41.5': UV–no; Dye–no reaction] Yellowish mudstone clast (fine gravel size) at 40.1 feet (2.5 Y 7/6)
41			ML		Silt with Sand (same as 9 to 14 feet).
42		100	CH		Clay (same as 14 to 20 feet).
			SM		[41.5–43: UV–no; OVA–85 ppm]
43			ML		Silty Sand (same as 20 to 20.5 feet) (thin layer of silt at 42 to 42.2 feet, same as 9 to 14 feet) [42': Dye–no reaction] [42–42.5': Dye–no reaction]
44		33	CH		Silt with Sand (same as 9 to 14 feet).
45		100			Clay (same as 14 to 20 feet). Minor slickensided structure at 43.5 feet [43.5–44': UV–no] [45–46.5': UV–no; Dye–no reaction]
46					
47		67			[46.5–48': Dye–no Reaction; Flecks of fluorescent material (probable fluorescent mineral and carbonate); OVA–35 ppm]
48					
49		87			Common carbonate streaks at 48.5 to 48.7 feet. [48.5–49.8': UV–carbonate stringers; OVA–65 ppm]
50		100			[50–51.5': UV–carbonate stringers; OVA–105 ppm] Common carbonate streaks at 50.3 to 50.4 feet.
51					
52		100			[51.5–53': UV–no; Dye–no reaction]
53					
54		100			
55		100			[55–56.5': UV–flecks of carbonate; OVA–150 ppm] Increased silt content at 55 to 55.2 feet, stiff.
56					
57		87			[56.5–57.8': UV–carbonate; OVA=150 ppm] Laminated sandstone pebble, 1.5 inches in length, at 56.7 feet. [57.5–57.8': Dye–no reaction] Increased silt content at 57.6 to 57.8 feet, stiff.
58					
59		33			Carbonate cemented layer at 58.7 to 60.1 feet, soil pores common. (Insufficient recovery from 58.5 to 60.5 feet for lab analysis.)

RPT NO.

FIGURE B–2. LITHOLOGIC LOG FOR SOIL BORING B–4

399-A\2062\LOG4\06/20/96

SOIL BORING: B-4

PROJECT NAME: Omega

PROJECT NUMBER: 445.02

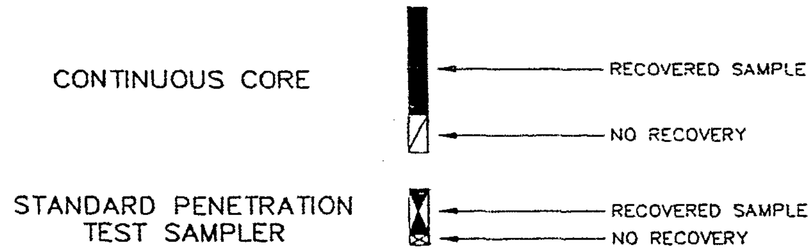
DATE DRILLED: 5/23/96

DEPTH (feet)	SAMPLE	RECOVERY %	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION OF MATERIAL
			CH		[60–61.5: UV–carbonate; Dye–no reaction]
61		100			Increased silt content at 60.2 to 60.6 feet, stiff.
					Carbonate streaks common at 60.6 to 61.5 feet
62		100			[61.5–63: UV–carbonate; OVA–140 ppm]
63					
64		67			
			ML		Silt with Sand (same as 9 to 14 feet).
65		100			[65–66.5': UV–no; OVA 150 ppm]
66			CH		Clay (same as 14 to 20 feet).
			ML		Silt with Sand (same as 9 to 14 feet), very moist.
67		100			[66.5–68': UV–no; Dye–no reaction; OVA–150 ppm]
			CH		Thin layers of Silty Sand, fine to medium, at 66.7 to 66.9 feet and 67.2 to 67.3 feet.
68					Clay (same as 14 to 20 feet).
69		80			
70		100			[Approximately 70': OVA–100 ppm]
					[70–71.5': UV–fluorescent mineral flecks]
71					Carbonate streaks common at 70.7 to 73.8 feet.
72		100			[71.5–73': UV–no; Dye–no reaction; OVA–250 ppm]
					Wet below 72.5 feet.
73					
74		100			
					[Approximately 75': OVA–200 ppm]
75					
76					TOTAL DEPTH OF BORING = 75 FEET BELOW LAND SURFACE
77					
78					
79					
80					

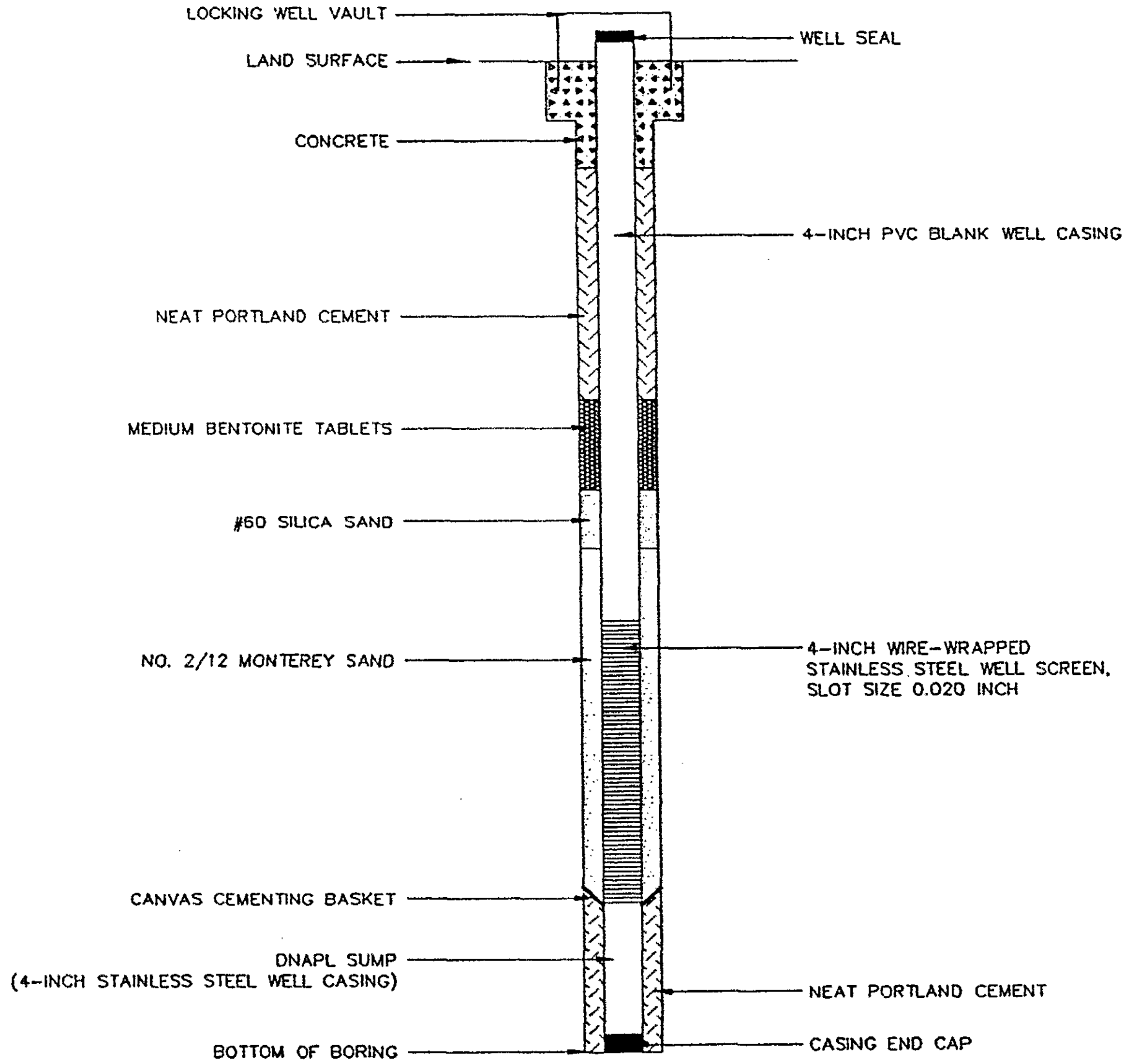
RPT NO.

SHEET 4 OF 4

FIGURE B–2. LITHOLOGIC LOG FOR SOIL BORING B–4



SAMPLE TYPE SYMBOLS



WELL CONSTRUCTION MATERIALS SYMBOLS

NOT TO SCALE

6/96	RPT NO. 445.04	710-0148	F

ENGLAND & ASSOCIATES

HARGIS + ASSOCIATES, INC.

FIGURE B-1. LITHOLOGIC LOG SYMBOLS

399-A\2062\LOGS\06/20/96

MONITORING WELL: OW-1

PROJECT NAME: Omega
PROJECT NUMBER: 445.2

LOCATION: See Figure 1.

COMMENTS: Sampler: 2.5 foot contirous core sampler & 1½-inch SPT sampler.

Weather: Hazy sunshine, wind 0–5 mph from east, 70° F.

DATE DRILLED: 6/4/96
BOREHOLE DIA.: 6.5-inch, reamed to 10"
DRILLING COMPANY: Gregg Drilling
DRILLER'S NAME: C. Winegarner
LOGGED BY: G. Cranham (R.G.# 5897)

SURFACE ELEVATION: 207.9 feet msl
TOTAL DEPTH OF BORING: 80 feet bls
METHOD: Hollow Stem Auger
DRILL RIG: Mobile Drill B-61
CHECKED BY: M. Palmer (R.G.# 5915)

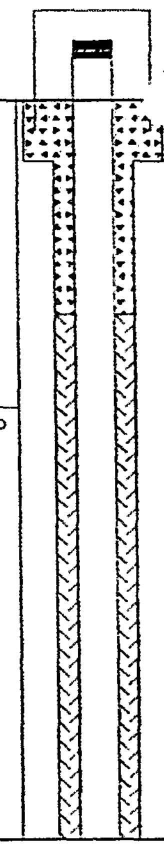
WELL DETAILS

DATE WELL INSTALLED: 6/4/96
SCREEN: 4-inch ID, 0.020-inch, stainless steel wire-wrap well screen.
CASING: 4-inch ID, flush threaded, schedule 40 PVC blank well casing.
DNAPL SUMP: 4-inch ID, flush threaded, stainless steel well casing
FILTER PACK MATERIAL: No. 2/12 Monterey Sand
SEAL: Concrete 0 to 3.5 feet bls
Neat Portland Cement 3.5 to 56.2 feet bls
Medium Bentonite tablets 56.2 to 59 feet bls

COVER: Above-ground locking steel vault
WATER LEVEL: 67.6 feet bls, (6/5/96)
SCREEN INTERVAL: 62.5 to 77.5 feet bls
CASING INTERVAL: 0 to 62.5 feet bls
DNAPL SUMP CASING INTERVAL: 77.5 to 80 feet bls
FILTER PACK INTERVAL: 59 to 77.5 feet bls
COMMENTS Filter pack separated from cement seal surrounding DNAPL sump by canvas cementing basket.

DEPTH (feet)	SAMPLE	RECOVERY %	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION OF MATERIAL
0					Concrete Slab
			ML CH		Clayey Silt to Silty Clay. Very dark brown, moist to very moist, loose.
5		72	ML		Silt with Sand, yellowish brown (10 YR 5/4), moist to very moist, soft to firm (crumbly), low plasticity, medium dry strength, low toughness, sand very fine, some carbonate pore fillings. [5–6.8': UV–no]
7.5		100			[7.5–10': UV–no]
10		84			[10–12.1': UV–no]

WELL DIAGRAM



RPT NO.	
SHEET 1 OF 5	

FIGURE B-3. LITHOLOGIC LOG FOR MONITORING WELL OW-1

399-A\26_ _G6\08/20/96

MONITORING WELL: OW-1

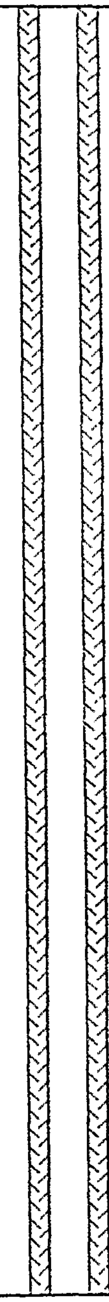
PROJECT NAME: Omega

PROJECT NUMBER: 445.2

DATE DRILLED: 6/4/96

DEPTH (feet)	RECOVERY %	USCS	LITHOLOGIC DESCRIPTION OF MATERIAL
	100	ML	[12.5–15': UV–no]
13			
14			Root casts or soil pores common at 14 to 15 feet.
15	84		Very moist at approximately 15 feet. [15–17.1': UV–no; Dye–no reaction] Granitic pebble at 15.7 feet
16			
17			
	100		[17.5–20': UV–no]
18			
19			
20	92		[20–22.3': UV–no; Dye–no reaction]
21			
22			
	36		[22.5–23.4: UV–no]
23			
24			
25	0		
26			
27			
	8		
28			
29			(Clay ball in auger bit may have interfered with recovery.)
30	88		Increased clay content at 30.1 to 30.4 feet.
31			
		CH	Clay, brown (10 YR 4/3), moist, very stiff, medium to high plasticity, medium toughness, high dry strength; trace silt, trace sand, occasional pebbles [31.5–32.5: UV–no; Dye–no reaction]
32	72		[32.5–34.3': UV–no]

WELL DIAGRAM



RPT NO.

SHEET 2 OF 5

FIGURE B–3. LITHOLOGIC LOG FOR MONITORING WELL OW-1

399-A\2062\LOG7\06/20/96

MONITORING WELL: OW-1

PROJECT NAME: Omega

PROJECT NUMBER: 445.2

DATE DRILLED: 6/4/96

DEPTH (feet)	SAMPLE	RECOVERY %	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION OF MATERIAL	WELL DIAGRAM
			CH		Slickensided Structure at 33 feet.	
34						
35		40			Increased silt content at 35.1 to 35.5 feet, stiff [35–36': UV–no; Dye–no reaction]	
36						
37			ML		Silt with Sand, same as 5 to 14 feet. [37.5–38.8': UV–no]	
38		52				
39						
40		40			[40–41': UV–no; Dye–no reaction]	
41						
42					[42.5–44.8': UV–no]	
43		92			43.6 to 44 feet: grades downward to clay.	
44			CH		Clay, same as 31.2 to 37 feet.	
45		76			Increased silt content at 45 to 46 feet and 47.5 to 48 feet. [45–46.9': UV–carbonates; Dye–no reaction]	
46						
47						
48		84			[47.5–49.6': UV–carbonate]	
49					Carbonate streaks common at 49 to 52 feet.	
50		100			Slickensided structure at 50 to 51.5 feet [50–52.5': UV–carbonate; Dye–no reaction]	
51						
52						
53						

RPT NO.

SHEET 3 OF 5

FIGURE B-3. LITHOLOGIC LOG FOR MONITORING WELL OW-1

399-A\ .OCB\06/20/96

MONITORING WELL: OW-1

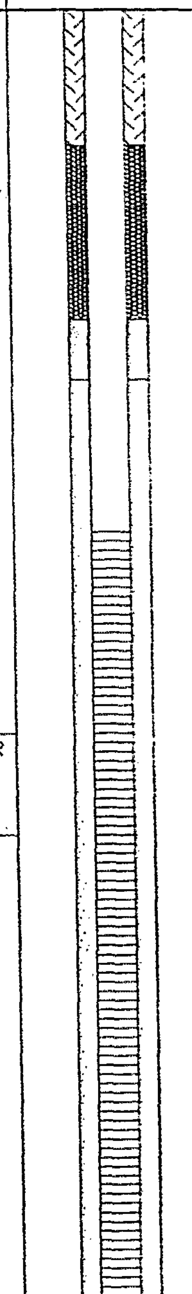
PROJECT NAME: Omega

PROJECT NUMBER: 445.2

DATE DRILLED: 6/4/96

DEPTH (feet)	SAMPLE	RECOVERY %	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION OF MATERIAL
			CH		
55					
56					
57					
58					
59					
60					
61					
62					
63					
64					
65		96			Clay: dark brown. [65-67.4': UV-no; Dye-no reaction; OVA-12 ppm]
66			ML		Silt, yellowish brown with reddish-brown fine sand patches, (silt: 10 YR 5/4; fine sand: 7.5 YR 5/8), moist Silty Sand, very moist to wet, medium to coarse, 0.05 foot thick, at base of silt, slight chemical odor.
67			CH		Clay, same as 31.2 to 37 feet, stiff.
68		100			[67.5-70': UV-no] Wet at 67.7 feet.
69					
70					
71					
72		100			[72-73.5': UV-no]
73					
74					

WELL DIAGRAM



RPT NO.

FIGURE B-3. LITHOLOGIC LOG FOR MONITORING WELL OW-1

399-A\2062\LOG9\06/20/96

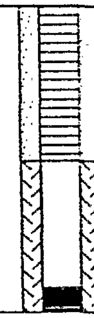
MONITORING WELL: OW-1

PROJECT NAME: Omega

PROJECT NUMBER: 445.2

DATE DRILLED: 6/4/96

DEPTH (feet)	SAMPLE	RECOVERY %	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION OF MATERIAL	WELL DIAGRAM
75–80	75–76.5	100	CH		Carbonate steaks common at 75 to 79.5 feet. Carbonate layer at 75.5 to 75.6 feet. Increased silt content below 75 feet, firm to stiff. [75–76.5': UV-carbonate]	
	78.5–80	100			[78.5–80': UV-no] Granitic pebble at 78.7 feet	
81					TOTAL DEPTH OF BORING = 80 FEET BELOW LAND SURFACE	



RPT NO.

SHEET 5 OF 5

FIGURE B-3. LITHOLOGIC LOG FOR MONITORING WELL OW-1

CDM
Camp Dresser & McKee, Inc.
18881 Von Karman Avenue, Suite 650
Irvine, CA 92612
Telephone: (949) 752-5452
Fax: (949) 752-1307

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-24699-T4.FIELD	**BORING/WELL NUMBER**	OW-1b
PROJECT NAME	Omega Chemical	**DATE DRILLED**	6/16/99-6/18/99
LOCATION	12504 East Whittier Blvd, Whittier, CA	**CASING TYPE/DIAMETER**	4" Sch 40, MS Blank
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	4" SS, 20-slot
SAMPLING METHOD	Modified CA Split Spoon	**GRAVEL PACK TYPE**	Lonestar #2/12
GROUND ELEVATION		**GROUT TYPE/QUANTITY**	Portland Cement/5% Bentonite/495 gal
TOP OF CASING		**DEPTH TO WATER**	59.00
LOGGED BY	Mike Hoffman	**GROUND WATER ELEVATION**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.0						CL		CONCRETE is 4 inches thick. SILTY CLAY: brown (10YR4/3); low plasticity, soft, no UV illumination, dry to moist, no odor.	0.3	
0.0	4 6 9	18			5	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, no UV illumination, dry to moist, no odor.	5.0	
0.0		18	OC-SG OW1b -10- 061699	SG	10	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated small fragments, dry to moist, no odor.	10.0	Cement-Bentonite Grout (0-96 ft bgs).
9.4	5 9 14	18			15	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft; trace pebbles to 1/2" diameter; UV illuminated small fragments and streaks, dry to moist, no odor.	15.0	
0.0		18	OC-SG OW1b -20- 061699	SG	20	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft; trace pebbles to 1/2" diameter; no UV illumination, dry to moist, no odor.	20.0	
9.4	9 16 20	18			25	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, no UV illumination, dry to moist, no odor.	25.0	4", Sch 40, MS Blank (0-110 ft bgs).
9.4		18	OC-SG OW1b -30- 061699	SG	30	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, no UV illumination, dry to moist, no odor.	30.0	
					35				35.0	

Continued Next Page

Camp Dresser & McKee, Inc.
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Irvine, CA 92612
Telephone: (949) 752-5452
Fax: (949) 752-1307

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-24699-T4.FIELD **BORING/WELL NUMBER** OW-1b
PROJECT NAME Omega Chemical **DATE DRILLED** 6/16/99-6/18/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
75.2	10 18 22	18	OC-S-OW1b-35-061699			CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, no UV illumination, dry to moist, no odor.		
18.8		18	OC-SG OW1B-40-061699	SG	40	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated small fragments, dry to moist, no odor.	40.0	
47.0	12 17 25	18	OC-S-OW1b-45-061699		45	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated small fragments, dry to moist, no odor.	45.0	Cement-Bentonite Grout (0-96 ft bgs).
23.5		18	OC-SG OW1b-50-061699	SG	50	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated small fragments, dry to moist, no odor.	50.0	
84.7	15 22 27	18	OC-S-OW1b-55-061699		55	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated small streaks, dry to moist, no odor.	55.0	
211.7		18	OC-SG OW1b-60-061699	SG	60	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated precipitate, dry to moist, moderate to strong hydrocarbon odor.	60.0	
122.3	7 18 24	18	OC-S-OW1b-65-061699		65	CL		SILTY CLAY: dark yellowish brown (10YR4/4); low plasticity, soft, UV illuminated precipitate and fragments, dry to moist, moderate to strong hydrocarbon odor.	65.0	4", Sch 40, MS Blank (0-110 ft bgs).
28.2	15 20 22	18	OC-S-OW1b-70-061699		70	CL		SILTY CLAY: brown (10YR4/3); low plasticity, stiff, UV illuminated fragments and streaks, dry to moist, no odor.	70.0	
					75				75.0	

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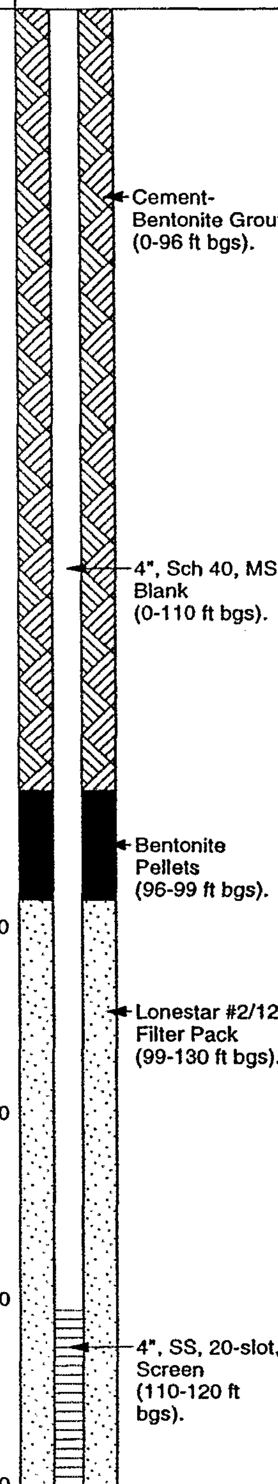
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-24699-T4.FIELD
BORING/WELL NUMBER OW-1b
PROJECT NAME Omega Chemical
DATE DRILLED 6/16/99-6/18/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
21.5	14 28 30	18	OC-S-OW1b -75-061699			CL		SILTY CLAY: brown (10YR4/3); low plasticity, stiff, UV illuminated fragments and streaks, dry to moist, no odor.	
21.5	12 28 31	18	OC-S-OW1b -80-061699		80	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated streaks, dry to moist, no odor.	80.0
4.7	10 11 13	18			85	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, UV illuminated streaks, dry to moist, no odor.	85.0
28.2	11 14 20	18	OC-S-OW1b -90-061699		90	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft, no UV illumination, dry to moist, no odor.	90.0
0.0	3 4 4	18			95	CL		SILTY CLAY: brown (10YR4/3); low plasticity, stiff, no UV illumination, dry to moist, no odor.	95.0
0.0	3 4 6	18	OC-S-OW1b -100-061899		100	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft to firm; traces of coarse sand to fine gravel; no UV illumination, dry to moist, no odor.	100.0
0.0	3 3 6	18			105	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft to firm; traces of coarse sand to fine gravel; no UV illumination, dry to moist, no odor.	105.0
0.0	5 5 9	18	OC-S-OW1b -110-061899		110	CL		SILTY CLAY: brown (10YR4/3); low plasticity, firm, no UV illumination, dry to moist, no odor.	110.0
					115				115.0

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-24699-T4.FIELD
BORING/WELL NUMBER OW-1b
PROJECT NAME Omega Chemical
DATE DRILLED 6/16/99-6/18/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.0	10 14 17	18				CL		SILTY CLAY: brown (10YR4/3); low plasticity, firm, no UV illumination, dry to moist, no odor.	120.0	4", SS, 20-slot, Screen (110-120 ft bgs).
0.0	4 8 12	18	OC-S-OW1b -120-061899		120	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft to firm; traces of coarse sand to fine gravel; no UV illumination, dry to moist, no odor.	125.0	
0.0	8 18 24	18			125	CL		SILTY CLAY WITH GRAVEL: brown (10YR4/3); 85% silty clay, low plasticity, soft; 15% gravel in matrix, up to 1/2" diameter, angular to subrounded, low to moderate sphericity; no UV illumination, moist, no odor.	130.0	Lonestar #2/12 Filter Pack (99-130 ft bgs).
0.0	6 8 14	18			130	CL		SILTY CLAY: brown (10YR4/3); low plasticity, soft to firm; traces of coarse sand to fine gravel; no UV illumination, dry to moist, no odor.	131.5	TD = 130 ft bgs.

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-24699-T4.FIELD	BORING/WELL NUMBER	OW-2
PROJECT NAME	Omega Chemical	DATE DRILLED	6/17/99
LOCATION	12504 East Whittier Blvd, Whittier, CA	CASING TYPE/DIAMETER	4" Sch 40, MS Blank
DRILLING METHOD	Hollow Stem Auger	SCREEN TYPE/SLOT	4" SS, 20-slot
SAMPLING METHOD	Modified CA Split Spoon	GRAVEL PACK TYPE	Lonestar #2/12
GROUND ELEVATION		GROUT TYPE/QUANTITY	Portland Cement/5% Bentonite/205 gal
TOP OF CASING		DEPTH TO WATER	
LOGGED BY	Mike Hoffman	GROUND WATER ELEVATION	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.0								CONCRETE is 3 inches thick.	0.3	
						CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity,stiff, soft, moist, no odor.		
0.0	5 9 10	18			5	CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	5.0	
0.0	5 5 14	18			10	CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	10.0	Cement-Bentonite Grout (0-50 ft bgs).
0.0	10 13 15	18			15	CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	15.0	
0.0	6 8 19	18			20	CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	20.0	
0.0	13 15 21	18			25	CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	25.0	4", Sch 40, MS Blank (0-60 ft bgs).
10.6	NA	18			30	CL		SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	30.0	
					35				35.0	

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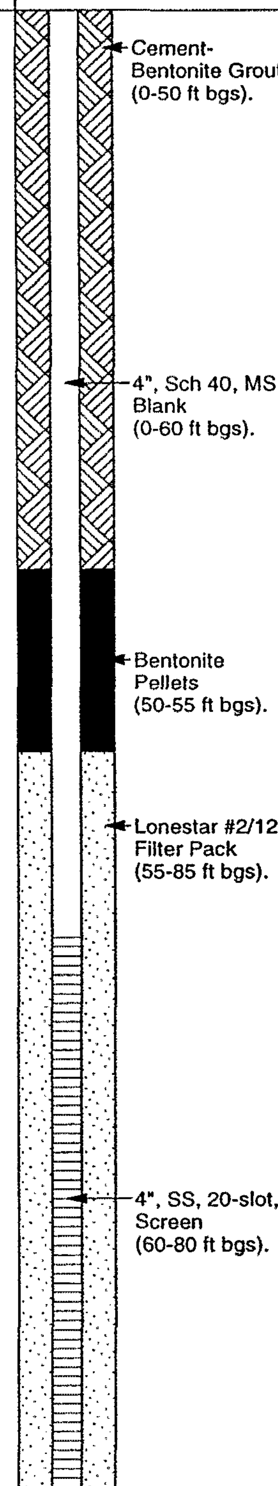
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-24699-T4.FIELD **BORING/WELL NUMBER** OW-2
PROJECT NAME Omega Chemical **DATE DRILLED** 6/17/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	DEPTH (ft. BGL)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
16.5	8 12 19	18			CL	SILTY CLAY: dark brown (10YR4/3); 100% silty clay, low plasticity; trace coarse sand to 1/4" diameter gravel; firm, moist, no odor.	40.0
16.5	15 19 22	18		40	CL	SILTY CLAY: dark brown (10YR3/3); 100% silty clay, low plasticity, soft, moist, no odor.	45.0
49.3	16 23 29	18	OC-S-OW2 -45-061799	45	CL	SILTY CLAY: dark brown (10YR4/3); 100% silty clay, low plasticity; trace coarse sand to 1/4" diameter gravel; firm, moist, no odor.	50.0
32.9	8 17 20	18		50	CL	SILTY CLAY: dark brown (10YR4/3); 100% silty clay, low plasticity; trace coarse sand to 1/4" diameter gravel; firm, moist, no odor.	55.0
0.0	9 14 20	18		55	ML	SILT WITH SAND: brown (10YR4/3); 85% silt, loose, soft, slightly cohesive; 15% very fine sand; slightly moist, no odor.	60.0
27.4	7 7 20	18	OC-S-OW2 -60-061799	60	SP SM	POORLY GRADED SAND WITH SILT: brown (10YR4/3); 90% sand, very fine to fine; 10% silt in matrix,; slightly moist, no odor.	65.0
21.9	10 14 22	18		65	SP SM	POORLY GRADED SAND WITH SILT: gray (10YR5/1); 95% sand, very fine to fine; 5% silt in matrix; very moist, slightly cohesive, no odor.	70.0
0.0	10 10 17	18		70	SP SM	POORLY GRADED SAND WITH SILT: gray (10YR5/1); 95% sand, very fine to fine; 5% silt in matrix; very moist, slightly cohesive, no odor.	75.0
				75			



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-24699-T4.FIELD
BORING/WELL NUMBER OW-2
PROJECT NAME Omega Chemical
DATE DRILLED 6/17/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.0	13 21 30	18				CL		SILTY CLAY: dark grayish brown (10YR4/2); 100% silty clay, low plasticity, soft, moist, no odor.	80.0	4", SS, 20-slot, Screen (60-80 ft bgs).
0.0	12 18 24	18	OC-S-OW2-80-061799		80	SC		CLAYEY SAND: brown (10YR4/3); 80% sand, very fine to fine: 20% clay in matrix and as balls, moderate plasticity; saturated, no odor.	85.0	Lonestar #2/12 Filter Pack (55-85 ft bgs).
0.0	NA	18			85	CL		SILTY CLAY: dark grayish brown (10YR4/2); 100% silty clay, low plasticity, soft, moist, no odor.	86.5	TD = 85 ft bgs.

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	10500-24699-T4.FIELD	**BORING/WELL NUMBER**	OW-3
PROJECT NAME	Omega Chemical	**DATE DRILLED**	6/15/99
LOCATION	12504 East Whittier Blvd, Whittier, CA	**CASING TYPE/DIAMETER**	4" Sch 40, MS Blank
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	4" SS, 20-slot
SAMPLING METHOD	Modified CA Split Spoon	**GRAVEL PACK TYPE**	Lonestar #2/12
GROUND ELEVATION		**GROUT TYPE/QUANTITY**	Portland Cement/5% Bentonite/210 gal
TOP OF CASING		**DEPTH TO WATER**	59.00
LOGGED BY	Mike Hoffman	**GROUND WATER ELEVATION**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.0								CONCRETE is 3 inches thick.	0.3	
						CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft, moist, no odor.		
0.0	3 3 4	18			5	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft, moist, no odor.	5.0	
0.0	4 6 10	18			10	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft, moist, no odor.	10.0	Cement-Bentonite Grout (0-53 ft bgs).
0.0	5 5 14	18			15	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, stiff, moist, no odor.	15.0	
0.0	5 7 13	18			20	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, stiff, moist, no odor.	20.0	
0.0	10 12 17	18			25	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft, moist, no odor.	25.0	4", Sch 40, MS Blank (0-63 ft bgs).
0.0	8 12 16	18			30	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, stiff, moist, no odor.	30.0	
					35				35.0	

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BORING/WELL CONSTRUCTION LOG

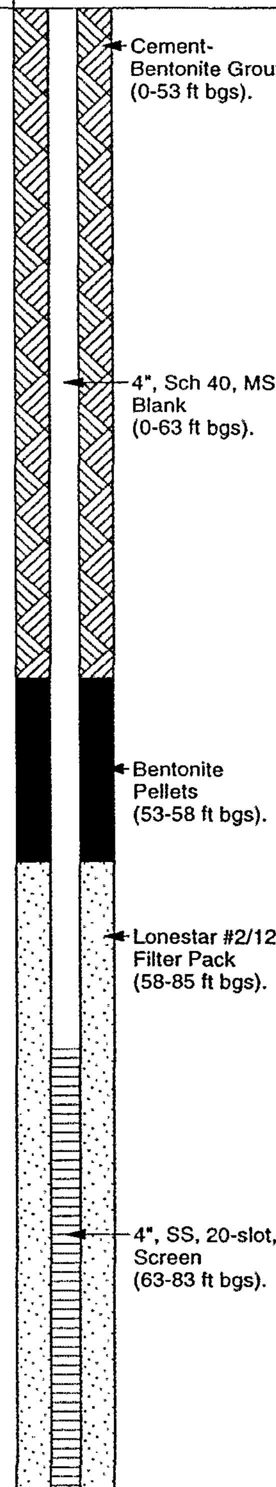
PROJECT NUMBER 10500-24699-T4.FIELD **BORING/WELL NUMBER** OW-3

PROJECT NAME Omega Chemical **DATE DRILLED** 6/15/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	DEPTH (ft. BGL)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0	10 13 20	18			CL	SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, stiff, moist, no odor.	
13.3	10 13 19	18	OC-S-OW3-45-061599	40	CL	SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, stiff, moist, no odor.	40.0
0.0	12 16 22	18		45	CL	SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, stiff, moist, no odor.	45.0
0.0	14 19 29	18	OC-S-OW3-50-061599	50	SW	WELL GRADED SAND: dark yellowish brown (10YR3/4); 95% sand, very fine to very coarse, angular to rounded, low to high sphericity; 5% gravel to 1/4" diameter, angular to subrounded, low to moderate sphericity; trace silt in matrix; moist, no odor.	50.0
0.0	22 28 31	18		55	SW	NO RECOVERY: assuming sand and gravel.	55.0
0.0	21 28 31	18		60	CL	SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft, moist, no odor.	60.0
0.0	17 25 40	18		65	CL	SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft, moist, no odor.	65.0
0.0	12 17 23	18		70	GC	CLAYEY GRAVEL: brown (10YR4/3); 60% gravel, angular to subrounded, low to moderate sphericity; 35% silty clay, low plasticity; 5% well graded sand, very fine to coarse; moist, no odor.	70.0
				75			75.0

WELL DIAGRAM



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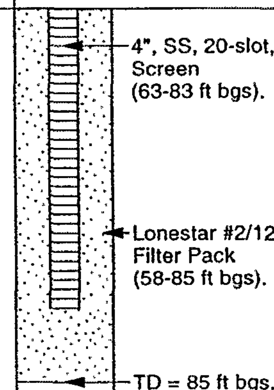
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 10500-24699-T4.FIELD
BORING/WELL NUMBER OW-3
PROJECT NAME Omega Chemical
DATE DRILLED 6/15/99

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (inches)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.0	8 18 20	18	OC-S-OW3-75-061599			CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft; trace gravel; moist, no odor.	
0.0	5 9 14	18			80	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, soft; trace gravel; moist, no odor.	80.0
0.0	10 31 21	18			85	CL		SILTY CLAY: brown (10YR4/3); 100% silty clay, low plasticity, stiff; trace gravel; moist, no odor.	85.0 86.5

WELL DIAGRAM



Appendix C
List of Violations and Enforcements

Table 2
SUMMARY OF VIOLATIONS AND ENFORCEMENTS
OMEGA CHEMICAL FACILITY

Inspections Date	Inspections Agency	Inspections Type	*Summary of Violations*	*Enforcement Actions*
04-24-84	DHS	Compliance Evaluation	Open and improperly labelled drums containing hazardous waste; inadequate aisle space in drum storage area.	DHS issued Omega a Notice of Violation dated 04-24-84.
04-05-85	DHS	Compliance Evaluation	Open containers holding haz. waste; no **impervious base in drum storage area**; incomplete haz. waste manifests.	DHS issued Omega a Notice of Violation dated 04-05-85.
08-26-85	DHS	Follow-up	Open drums containing haz. waste; improper labelling of haz. waste hauling trucks.	None
08-02-86	DHS	Compliance Evaluation	Leaking haz. waste drums; no emergency alarm systems, inadequate aisle space; no inspection log; no closure cost estimate.	DHS issued Omega a Notice of Violation dated 08-12-86.
11-18-87	DHS	Compliance Evaluation	Several safety violations; **no impervious base in the haz. waste storage area**; stored onsite haz. waste more than 90 days; stored offsite haz. waste on southeast parcel.	DHS issued Omega a Report of Violation dated 02-17-88. DHS issued Omega a Corrective Action and Complaint for Penalty dated 10-29-88. A Consent Agreement and Order between DHS and Omega was issued on 08-18-89.
08/89 and 09/89	DHS	Compliance Evaluation	**Disposal of haz. waste onto ground and air**; storage of haz. waste in open and leaking drums; numerous safety, operational, and administrative violations.	DHS issued Omega an Directive to Comply dated 08-25-89. DHS issued Omega n Report of Violation dated 10-05-89.
06-18,19-90	DHS	Compliance Evaluation	Storage of haz. waste in open and leaking drums; numerous (17) safety, operational, and administrative violations.	None
09-05-90	DHS	Follow-up	Storage of haz. waste in open and leaking drums; several (10) safety, operational, and administrative violations.	None

Reference: Level I Environmental Assessment Report, Omega Chemical Corporation prepared by Century West Engineering Corporation, May 14, 1992.

Table 2
SUMMARY OF VIOLATIONS AND ENFORCEMENTS
OMEGA CHEMICAL FACILITY

Inspections				
Date	*Agency*	*Type*	*Summary of Violations*	*Enforcement Actions*
10-11-90	DHS	Follow-up	Eight operational and safety violations, including violations of Part A permit application.	DHS issued Omega a Report of Violation dated 10-6-90.
11-27-90	DHS	Follow-up	Ten operational and safety violations, including violations of Part A permit application.	Los Angeles Superior Court issued a Preliminary Injunction enjoining Omega from accepting any offsite haz. waste until pending compliance with haz. waste laws and ISD.
12-21-91	DHS	Follow-up	Nine operational and safety violations, including intentionally or negligently making false statements or misrepresentations on haz. waste labels on haz. waste drums.	None
02-14-91	San Bernadino Co. DA & LA Co. DA	Search Warrant	In searching three railcars containing Omega haz. waste drums, observed illegal storage and transportation of 700 haz. waste drums, and Omega personnel falsified haz. waste manifests and drum labels.	None
04-16-91	DHS	Follow-up[1]	Nine operational and safety violations, including intentional or negligent labelling of haz. waste drums by Omega workers.	None
05-14-91	DHS	Search Warrant	Five operational and safety violations.	None
07-18-91	DHS	Part B permit appl. Evaluation	Fifteen operational and safety violations, including several instances where Omega misrepresented information in its proposed Part B permit application.	DHS issued Omega a Report of Violation dated 08-23-91.

[1] - Consent to inspect was refused and an inspection warrant was obtained by DHS.

Reference: Level I Environmental Assessment Report, Omega Chemical Corporation prepared by Century West Engineering Corporation, May 14, 1992

Appendix D
Omega Chemical Corporation Operation Plan

I. FACILITY IDENTIFICATION

1. EPA Identification number

   EPA Number CAD042245001

   A Part A and Part B was originally submitted to the Department of Health Services and Environmental Protection Agency Region IX in 1980. Since then there have been submittals of amended and revised Part A's and Part B's documents to these respective agencies. A copy of the most recent modified Part A is included in the Appendix L of this document.

2. Treatment Facility Name

   Omega Chemical Corporation and Omega Recovery Services which is a wholly owned subsidiary of Omega Chemical Corporation.

3. Type of facility

   This facility provides off site treatment of commerical and industrial wastes both liquids and solids. This treatment is primarily accompolished by the recycling of chemicals and hazardous waste through the use of specialized treatment which includes distillation, wiped film evaporation, physical separation, dewatering, filtering, and chemical separation. The products from this recycling process are sold back to the original users and other consumers of these products. The wastes from these treatment processes is then manifested to off-site licensed facilites for use as supplemental fuels, for destructive incineration, or for disposal by other approved and licensed means.

   This facility also serves as a transfer station., providing storage and consolidation for containerized and bulk wastes which are not amenable to treatment at the facility.

   Omega has developed a five year program to improve the facility which would provide additional treatment capacity as well as new methods of treatment technologies for various forms of hazardous and non hazardous wastes. The proposed waste treatment systems are shown in the various appropriate sections of this Part B Operation Plan Section VI.

4. Facility Mailing Address

   Omega Chemical Corporation
   P.O. Box 152
   Whittier, CA 90608

5. Facility Location

   Omega Chemical Corporation
   12504 E. Whittier Blvd.
   Whittier, CA 90602

6. Phone Number

   213 698 0991

7. Standard Industrial Classification

   4953 Recycled Solvients and Hazardous Wastes
   5161 Wholesale Distribution

B Operation Information

1. Legal Owner
   Omega Chemical Corporation

2. Mailing Address
   P.O. Box 152
   Whittier, CA 90608

3. Telephone
   (213) 698-0991

C. Owner of land and building
   Omega Chemical Corporation

2. Mailing Address
   P.O. Box 152
   Whittier, CA 90608

3. Phone Number
   213 698 0991

D Contact Individual

1. Dennis R. O'Meara

2. Title: President

3. Phone: (213)-698-0991

4. Work Address
   12504 E. Whittier Blvd.
   Whittier , Calif. 90602

E Preparation of Operation Plan

1. Firm: Omega Chemical Corporation

2. Individual: Dennis R. O'Meara

3. Title: President

4. Phone: (213) 698-0991

F. Date of DHS Instructions, October 1985

G. Certification of Preparation

"I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. Omega Chemical Corporation

Dennis R. O'Meara
Dennis R. O'Meara
President
October 29, 1990

I. Waste Minimization Certification

I hereby certify under penalty of law that personnel under my direction and supervision at this facility are undertaking specific steps in accordance with a program in place to minimize the amount and toxicity of hazardous wastes generated at this facility to a degree economically praticable and that the method utilized for the treatment, storage, or disposal of hazardous wastes is the practicable method currently available to this facility which minimizes the present and future threat to human health and the environment. I am aware that there are significant penalties for false certification, including the possibility of fine and imprisonment for flagrant falsifications.

Dennis R. O'Meara
Signature
Dennis R. O'Meara
Name
President
Title
October 29, 1990
Date

II. MAPS OF FACILITY AND SURROUNDINGS

A Series of Maps and Drawings are shown to provide the required informaton for this section of the Operation Plan

A. General Topographic Map

Area extending one mile beyond property boundaries of facility is shown on Figure II-1.

B. Map of the Whittier City Planning Department (Figure II-2)

This shows the land use designations for the site and surrounding property. An area with 2000 feet radius is drawn on the map. (Figure II-2). This site is designated as M,heavy manufacturing which is consistent with the both current and proposed operations.

There are no intakes or discharge structure on the facility except for sanitary sewer in the building.

There are no wells for underground injection of fluids.

C. Map of California Department of the Interior Geological Survey - Water Resources Division. (Figure II-3)

This map shows wells and springs in the area surrounding the Whittier facility site. An area circumscribed by a circle with a radius of 2000 feet is shown with the site in the center. There are no wells, springs, surface water bodies, drinking water wells, aqueducts or public water supply systems on site or within the described area.

Water Bodies and Surface Water that is closest to the facility is the Whittier Narrows. This is located over four miles to the northwest of the site.

D. Detailed map having the following: this is taken from the Los Angeles County Assessor's Map Book (Figure II-4):

1. Map Layout Showing
   - (a) Scale (Shown on Map)
   - (b) North Arrow
   - (c) Date Map Completed (January 10, 1990)
   - (d) Facility plus surroundings extending 2000 feet beyond the perimeter of facility.
   - (e) Location of facility
     - (1) Latitude 04/03/30
     - (2) Longitude 37/59/05
     - (3) Township
     - (4) Range
     - (5) Sections
     - (6) Principal Meridian
     - (7) Assessor's Parcel Identification Numbers
       Map Book 8170 Page 029 Parcel 004
       Map Book 8170 Page 029 Parcel 005
       Map Book 8170 Page 029 Parcel 015
       Map Book 8170 Page 029 Parcel 016

E. Drawings of Current facility showing present operations and proposed. Figure II-5,6, and 7 depict the existing and proposed facility configuration respectively. Full Scale Maps are included in the Appendix A. The following features are shown on one or both of these figures.

Scale
North Arrow
Date the Map was completed
Locations of the permanent internal roads
Security fencing and access points (see also Contingency Plan: Appendix G)
Waste storage and treatment tank identities and locations
Container storage areas
Waste treatment system locations
Location of each facility used for hazardous waste.
(a) Treatment
(b) Storage
Waste loading and unloading areas
Secondary containment structures
Buffer zones around tanks and containers holding ignitable wastes
Support buildings (e.g., office buildings, laboratory, control room, maintenance building, etc.)
Process sewage system, sewer lines and utility easements.
Surface drainage in waste management areas presently is contained within secondary containment structures

F. Land Characteristics

(a) Existing contours and elevations are shown on the U.S.G.S. map Figure II-1

(b) Proposed final contours: No significant changes to the existing contours are proposed.

(c) Whittier no longer has 100 year flood plain map. No certification that facility is not subject to a 100 year flood plain unundation has not been provided by the US Army Corps of Engineers. Federal Flood Insurance Rate Map has not been prepared for the City of Whittier. Due to the fact that it has no flood plain. This has been verified at Los Angeles County Flood Control District. The site is located in a HUD designated Flood Zone "C", in which there is no danger from flooding, an area of minimal flooding after a 500 year flood. A letter from the Los Angeles County Flood Control District is attached (Figure II-8)

(d) There are no surface waters see Map Figure II-3 also verified in USGS topographic map Figure II-1.

(e) Prevailing wind speed and direction. This is provided by a Wind Rose see Figure II-9 .

(f) Land uses and zoning. This is provided in Whittier Land Use see figure II-2. It is M-2 Zone- Heavy Manufacturing.

G Facility Characteristics

(a) Legal Boundaries see Figure II-4

(b) Location of permanent access roads see Figure II-4 and Figure II-10
The frontage road along Whittier Boulevard and southern access on Putnam Street are a concrete paved, two-laned, two-way, throughfares with concrete curbs, gutters, and parallel parking on both sides. Whittier Boulevard proper is a divided four-lane, two-way, asphalt paved roadway with concrete curbs and gutters.

(c) There are no internal roads

(d) Traffic associated with facility on and off site

Traffic Flow Plan

All access to the Project site will be carefully controlled. Security fences will restrict access to all areas. Visitor access will only be through the office. Entering trucks will first log-in and identify themselves and present the appropriate manifest and documents to the plant supervisor.

Access for trucks will be directed to the Putnam Street access as the preferred approach to the facility.

Approximately six trucks per day, or about one per every two hours, may be processed; therefore, traffic is not expected to be a problem.

The trucks will proceed to the truck unloading points where the material will be discharged. After which they will exit through the security gate .

(1) Traffic Pattern
Current traffic flow pattern is shown onFigure II-10.
Proposed traffic flow pattern is shown on Figure II-10

(2) Control Methods
All incoming waste vehicles will be directed by Omega employees to an appropriate loading or unloading area.

(3) Location of control signals
A traffic signal is located at Whittier and Washington Boulevard interchanges. There are stops signs at the Putnam and Washington Blvd. intersection.

(4) Type of surface and/or bearing capacity of roads.
The surface streets in the area are deesigned for heavy truck traffic, they are designed to handle 80,000 pound commerical vehicles.

(e) Security fencing

(1) Location

The entire Project site is surrounded by 6 foot minimum security fences. All gates to the process areas, requiring operator clearance for access, will normally be closed. In the proposed expansion this security fencing will be continued. All appropriate signs are attached to the access displaying that this is a hazardous waste facility.See Figure II-5, II-6.

(2) Type

The facility has a cyclone wire type fence and concrete block walls surrounding the entire facility. The facility operates with supervision 24 hours per day, 7 days a week. All gates are closed. They are opened by Omega personnel for movement of vehicles only.

(f) Access Control

(1) Location
Access locations are the various gates and building doors shown in (Figure II-5,II-6)

(2) Type

To the administration building access from the front is through a door. This is occupied by office personnel during day business hours. It is locked during non office hours. The gate to the operating areas is closed and supervised during operating hours. We operate 24 hours a day 7 days a week. At all other times, the facility is locked. In the office all visitors must register and sign in our guest book.

(g) Names, locations, and dimensions of past, present of the following:

(1) Treatment facilities

Present

FAT JACK - Treatment Unit T-1
Location: (Figure II-7)
Dimension: It is 36 feet wiped film processor manufactured 1979 by Pfuadler. It is all stainless steel.

KIRK- Treatment Unit T-2
Location: (Figure II-7)
Dimension: 20 foot by 1 foot distillation column. It is all stainless steel.

PAUL- Treatment Unit T-3
Location: (Figure II-7)
Dimension: It is 350 Gallon pressure vessel with 30 foot by 8 inches distillation column. It is all stainless steel.

CRAIG- Treatment Unit T-4
Location: (Figure II-7)
Dimension:It is 500 Gallon pressure vessel with 20 foot by 8 inch diameter distillation column. It is all stainless steel.

NEAL- Treatment Unit T-5
Location: (Figure II-7)
Dimension: It is 50 Gallon glass lined reactor. It is manufactured by Pfuadler Corporation.

JAKE- Treatment Unit T-6
Location: (Figure II-7)
Dimension:It is 13.5 feet wiped film processor manufactured 1983 by Pfuadler. It is all stainless steel.

MORK- Treatment Unit T-7
Location (Figure II-7)
Dimension:It is 1000 Gallon pressure vessel with 20 feet by 1 foot diameter distillation column. It is all stainless steel.

PETE- Treatment Unit T-13
Location: (Figure II-7)
Dimension:It is 2500 Gallon Pressure vessel with 20 foot by 1 foot distillation column. It is also stainless steel.

LIQUID EXTRACTION - Treatment Unit T-9
Location: (Figure II-7)
Dimension: This unit can perform liquid liquid extraction where two different liquids can exchange both physical and chemical properties through the liquid liquid extraction method.

SOLIDS GRINDING UNIT - Treatment Unit T-16
Location (Figure II-7)
Dimension:This unit grinds compatible solid waste to a pumpable liquid form. When in a liquid form it can be treated by other treatment units or be shipped off site to an another treatment facility in its liquid state.

PATRICK - Treatment Unit T-10
Location (Figure II-7)
Dimension:It is a 36 feet wiped film processor. It is all stainless steel.

Future
KIRK II - Treatment Unit T-8
Location (Figure II-7)
Dimension: 20 foot by 1 foot distillation column. It is all stainless steel.

CRAIG II - Treatment Unit T-11
Location (Figure II-7)
Dimension:It is 500 Gallon pressure vessel with 20 foot by 8 inch diameter distillation column. It is all stainless steel.

NEUTRALIZATION AND PRECIPITATION UNIT - Treatment Unit T-15
Location: (Figure II-7)
Dimension: It is oxidation reduction unit to reduce waste water organics through ultraviolet light and ozone and/or hydrogen peroxide.

PACT UNIT - Treatment Unit T-17
Location (Figure II-7)
Dimension:It is biological waste water unit to reduce all organics to carbon dioxide and water.

Treatment units - There are several tanks and processing equipment that are used as neutralization or filtering systems.
Location:
Dimension:

(2) Storage Facilities

These are all stainless steel tanks. They are all identified in Figure II-11
<u>Present</u>
STORAGE #A- 10000 Gallon
STORAGE #B- 10000 Gallon
STORAGE #C- 10000 Gallon
STORAGE #D- 10000 Gallon
STORAGE #E- 10000 Gallon
STORAGE #F- 10000 Gallon
Location:Figure II-11
Dimension: See Appendix D

<u>Present</u>
HEIDI - 5500 Gallon
JENNY - 3500 Gallon
SANDEE - 2000 Gallon
ELAINE - 2000 Gallon
CARRIE - 2000 Gallon
CONNIE - 2000 Gallon
AMY - 650 Gallon
SUSAN - 500 Gallon
PEGGY - 750 Gallon
SHEILA - 1300 Gallon
CINDY - 1200 Gallon
LINDA - 500 Gallon
DIANE - 500 Gallon
LOUDY - 500 Gallon
RAQUEL - 750 Gallon
FARRAH - 750 Gallon
Location:Figure II-11
Dimension: See Appendix D

The Following are Carbon Steel Tanks
STORAGE #1- 5,000 Gallon
STORAGE #2- 5,000 Gallon
STORAGE #3- 5,000 Gallon
STORAGE #4- 5,000 Gallon
STORAGE #5- 5,000 Gallon
Location:Figure II-11
Dimension: See Appendix D

The Following are Stainless Steel Tanks for Various Organic Type Waste
<u>Future</u>
STORAGE #7- 10000 Gallon
STORAGE #8- 10000 Gallon
STORAGE #9- 10000 Gallon
STORAGE #10- 10000 Gallon
STORAGE #11- 10000 Gallon
STORAGE #12- 10000 Gallon
STORAGE #13- 10000 Gallon
STORAGE #14- 10000 Gallon
STORAGE #15- 10000 Gallon
STORAGE #16- 10000 Gallon
STORAGE #17- 10000 Gallon
STORAGE #18- 10000 Gallon
STORAGE #19- 10000 Gallon
Location:Figure II-11
Dimension: See Appendix D

The Following are Pressure Tanks for the Storage of CFC's
CFC 1 - 5500 Gallon
CFC 2 - 5500 Gallon
CFC 3 - 5500 Gallon
CFC 4 - 5500 Gallon
Location:Figure II-11
Dimension: See Appendix D

The Following are Stainless Steel Tanks for Intermediate Processing of Waste Materials
<u>Future</u>
STORAGE #20- 750 Gallon
STORAGE #21- 750 Gallon
STORAGE #22- 750 Gallon
STORAGE #23- 750 Gallon
STORAGE #24- 500 Gallon
STORAGE #25- 500 Gallon
STORAGE #26- 500 Gallon
PROCESS 1 - 1000 Gallon
PROCESS 2 - 1500 Gallon
PROCESS 3 - 1500 Gallon
PROCESS 4 - 1500 Gallon
PROCESS 5 - 1500 Gallon
Location:Figure II-11
Dimension: See Appendix D

The following are plastic tanks for waste water treatment. They are all identified in Figure II-11. They are all above ground and diked.

Future
STORAGE TANK # 27 -8000 GALLON
STORAGE TANK # 28 -8000 GALLON
STORAGE TANK # 29 -8000 GALLON
STORAGE TANK # 30- 8000 GALLON
STORAGE TANK # 31- 8000 GALLON
STORAGE TANK # 32- 8000 GALLON
STORAGE TANK # 33- 8000 GALLON
STORAGE TANK # 34- 8000 GALLON
STORAGE TANK # 35- 8000 GALLON
STORAGE TANK # 36- 8000 GALLON
Location:Figure II-11
Dimension: See Appendix D

(3) Loading and unloading facilities associated with waste storage or treatment

These areas are located on the map Figure II-12. They are located at the closest areas to the entrances to the facility.There will be no unloading of waste material until the waste has been cleared and approved as acceptable for Omega to treat and handle. Until that time all trucks or vehicles containing waste will remain in the quarantine area (see Figure II-5,II-6).

After approval the waste material will either be pumped to an appropriate storage tank in the tank farm area if it is liquid. If it is a drum or container type that has waste substance it will be removed from the truck by either a forklift or liftgate and then palletized for storage in the drum storage area (see Figure II-5,II-6)

All of our trucks have lift gates for the loading and unloading of their cargoes. Omega will have forklifts with special attachments for handling material in drums.

In addition there will be air operated diaphragm pumps. These pumps can be used to evacuate material from tanks, tankers and drums. This method reduces the handling required for emptying containers plus the additional benefit of reducing air emissions from the transferring of waste material.

(4) Specific locations and identity of containers or tanks holding ignitable and incompatible wastes, are identified in Figure II-13. They are further identified in Section VI.

Reactive Wastes will not be received at the facility.

All the storage tanks that are designed to hold ignitable wastes shall be compatible with these types of wastes. These tanks are all located within a diked area and meet the National Fire Protections Code for materials of construction and location within a proper area. Storage of containers holding hazardous waste are identified in Figure II-5,II-6.

All storage tanks designeated for corrosive type wastes will be compatible with these types of wastes. These tanks are located within a diked area and meet appropriate construction standards. They are identified in Figure II-11.

Containerized incompatible wastes will be segregated in accordance with waste types and compatibilities in their appropriate storage areas. See Section VI Containers

(5) Equipment and container cleaning areas are identified in Figure II-5,II-6.

All equipment will be cleaned in their various operating locations. These locations are designed with diked perimeters to contain any spills or loss of waste material. The location of the equipment is identified in Figure II-7. The maintenance shop area is also a controlled area to avoid any contamination from the release of waste material.

(6) Building - (Figure II-15)

There are four buildings
Building A is an administrative and laboratory facility.
Building B is warehouse and treatment.
Building C is boilers and cogeneration.
Building D is warehouse and office..

(7) Containment Structures See Figure II-16

DRAINAGE

With the facility handling materials which could be potentially classified as a hazardous waste, the issue of handling surface water drainage is an area of concern, since even though the probability is remote, there exists the potential for spills of material, particularly while transferring incoming materials from trucks or railroad cars. Storage areas, particularly where drums are stored, also have a high spill potential.

Even though the water table is not close to the surface, the decision was made to cover all operating and storage areas with an impermeable coating. The traditional methods of preventing the migration of hazardous wastes in soils is to provide a layer of impermeable material such as bentonite covered with a plastic liner such as polyvinyl chloride, with provision for sampling tubes, etc. to check on the physical integrity of the barrier. This method is believed not to be suitable for this site in that many of the solvents handled, if placed in contact with materials such as bentonite make the material swell, thus reducing its physical integrity. Others of the solvents can dissolve the binders used to make polyvinyl chloride films, allowing them to disintegrate and lose physical integrity. Thus the traditional methods of controlling the in soil migration of hazardous wastes are potentially vulnerable to attack by the materials they are attempting to contain.

It is believed that this issue can best be addressed by the adoption of three key physical design criteria. These are:

a. All piping and equipment handling or storing potential hazardous waste material must be placed above ground, and clearly visible for physical inspection at all times.

b. All areas where the potential for spills exist must be covered by a high strength impermeable coating.

c. Provision must be made for all areas where potentially hazardous materials are, or can be, present, to be drained in a manner such that any water falling on these areas will be directed to a containment area where the water can be treated or neutralized before it is discharged into a sewer or allowed to follow natural drainage courses.

To contain any rainwater which would fall on the site, provision will be made for all rain which falls on operating and storage areas to be drained to the tank storage areas. All of the tanks in these areas will be elevated on legs or on structures above the surface so that they can continually be monitored for possible leakage and will be designed so that they will be restrained against flotation forces if they are empty.

Rainwater which falls on the roofs of the processing buildings and warehouse office will be collected and passed directly to the irrigation system . All other water, except that falling on planted areas and retained there, will be captured and impounded. The holding sump is designed to contain 9 inches of rain falling on the facility. The maximum amount of rainfall in 24 hours recorded in this area of Los Angeles County during the 41 year period of record, 1940 to 1981. Extrapolation to a 100 year period suggests a design rainfall of 6.4" in a 24 hour period.

Because of the large dilution of potential materials spilled on the surface by rainfall, the use of conventional materials can be considered for the rainfall containment and disposal systems.

Provision for a structure similar to an API separator will be made to separate out the rocks and floating materials, such as leaves or oils, from the rainwater. There are two treatment options. The water can either be passed through one of the distillation columns, producing distilled water, and a residue to be disposed of. The disposal system should be capable of handling 1.5\inches per day of rainfall (75\gpm) making the capacity of the holding basin equivalent to a 10.5\inch rainfall which should provide an adequate margin of safety.

Dikes are in place around the entire facility. This is to contain all rain run off and any spills. In addition, there is another dike around the major storage tanks.

(8) Buffer Zones

There are the required spaces around all storage tanks and equipment as defined in the National Fire Codes.

(9) Other structures are depicted and defined in (Figure II-5,II-6).

(a) Locations and types of:

1. Environmental monitoring stations -
   The sewer discharge is monitored by the Los Angeles County Sanitation District.
   The emissions to the air are monitored by the South Coast Air Quality Mangement District.
   All tanks and processing systems are above ground on diked impermeable concrete containment system. Since this facility is not a disposal facility but a recycling and treatment facility no other environmental monitoring equipment is present. .

2. Facilities for controlling surface drainage. The facility is diked. All drainage is channeled to a holding area. This has a sump for pumping the rain or spills to an appropriate holding tank.

3. Injection and with drawal wells
   There are no injection or withdrawal well on the facility or associated with the facility.

(b) Location through facility of

1.. Power Lines.
There are power lines that bisect the facility. They are shown on the facility map in Figure II-17
.

2. Pipelines - None

3. Easements - None

C. Provide the following information associated with the maps.

1. The legal description of the property is
   Legal Description
   Lots 3,4,15, & 16 of Tract 13486, City of Whittier, Los Angeles County, California
   This property is owned and controlled by Omega Chemical Corp. copy of the tax records are shown in Figure II-18 . It is located at 12504 E.Whittier Blvd., Whittier, California 90602, 200 feet in width and 440 feet in depth.

2. Estimated volume of traffic

   (a) There are an average of 8 trucks coming and leaving the facility per working day.

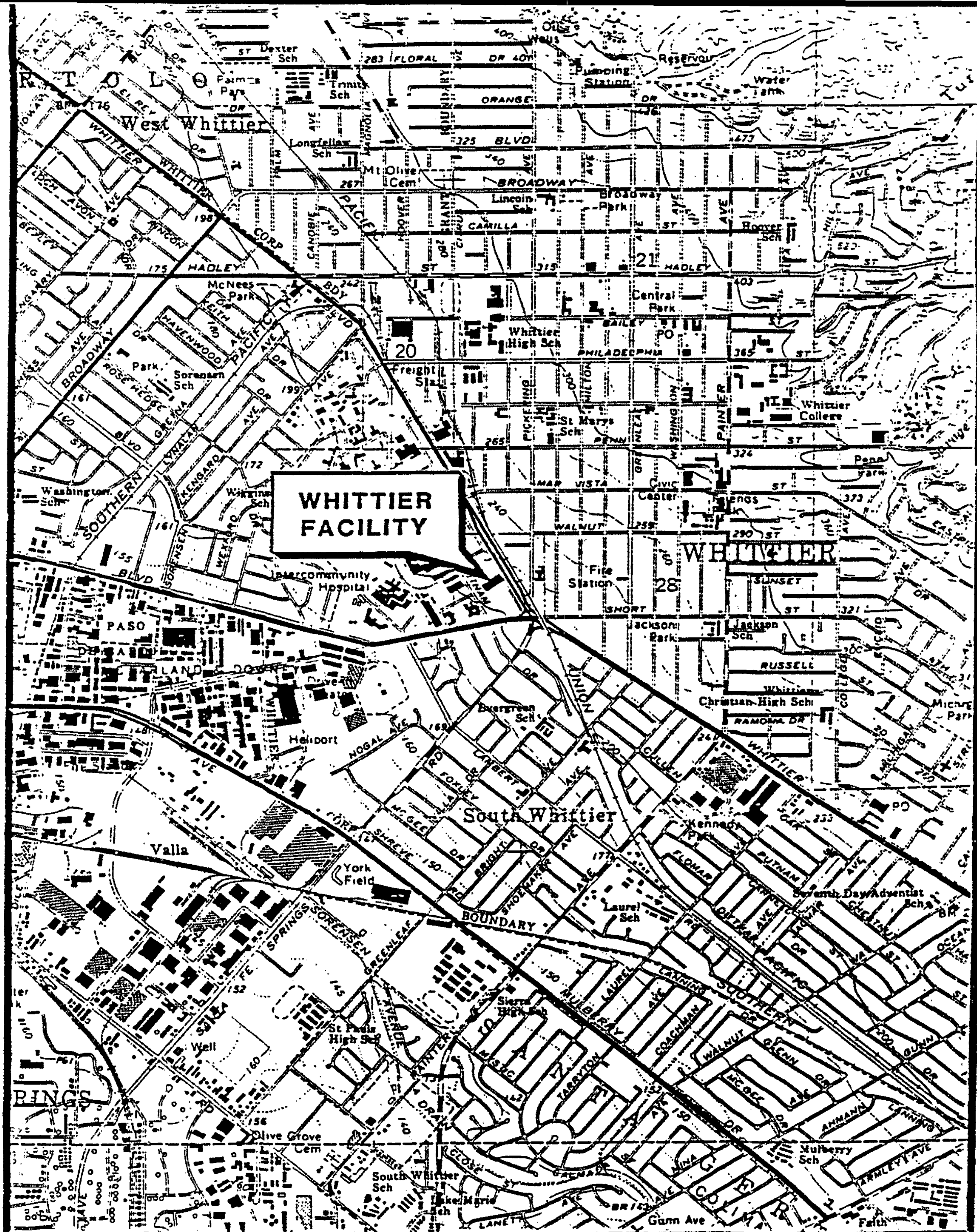
   (b) These trucks range from pick up to 8000 gallon tank trucks.

3. Characteristics of permanent access roads.

   (a) Concrete paved

   (b) Maximum California load bearing capacity 80,000 pounds per vehicle.

4. Existing facilities - Photograph essay of current facility See Figure II-19.



Site Location and Topographic Map
Omega Chemical Company
Whittier, CA

Source: Whittier, CA
USGS 7.5 Minute Quadrangles
1 inch = 2000 feet

ORD 2291 JAN 20, 1983 ZC
ORD 2360 OCT 26 1985 ZC

ORD. 2280 APR. 23, 1982 ZC0-05
ORD. 2252 FEB 6, 1981 ZC0-09

5C

NOTE: INDEX MAP SHOWS LOCATION OF SECTIONAL DISTRICT MAPS AND LEGEND OF ZONE SYMBOLS

OFFICIAL ZONING MAP - CITY of WHITTIER, CALIFORNIA

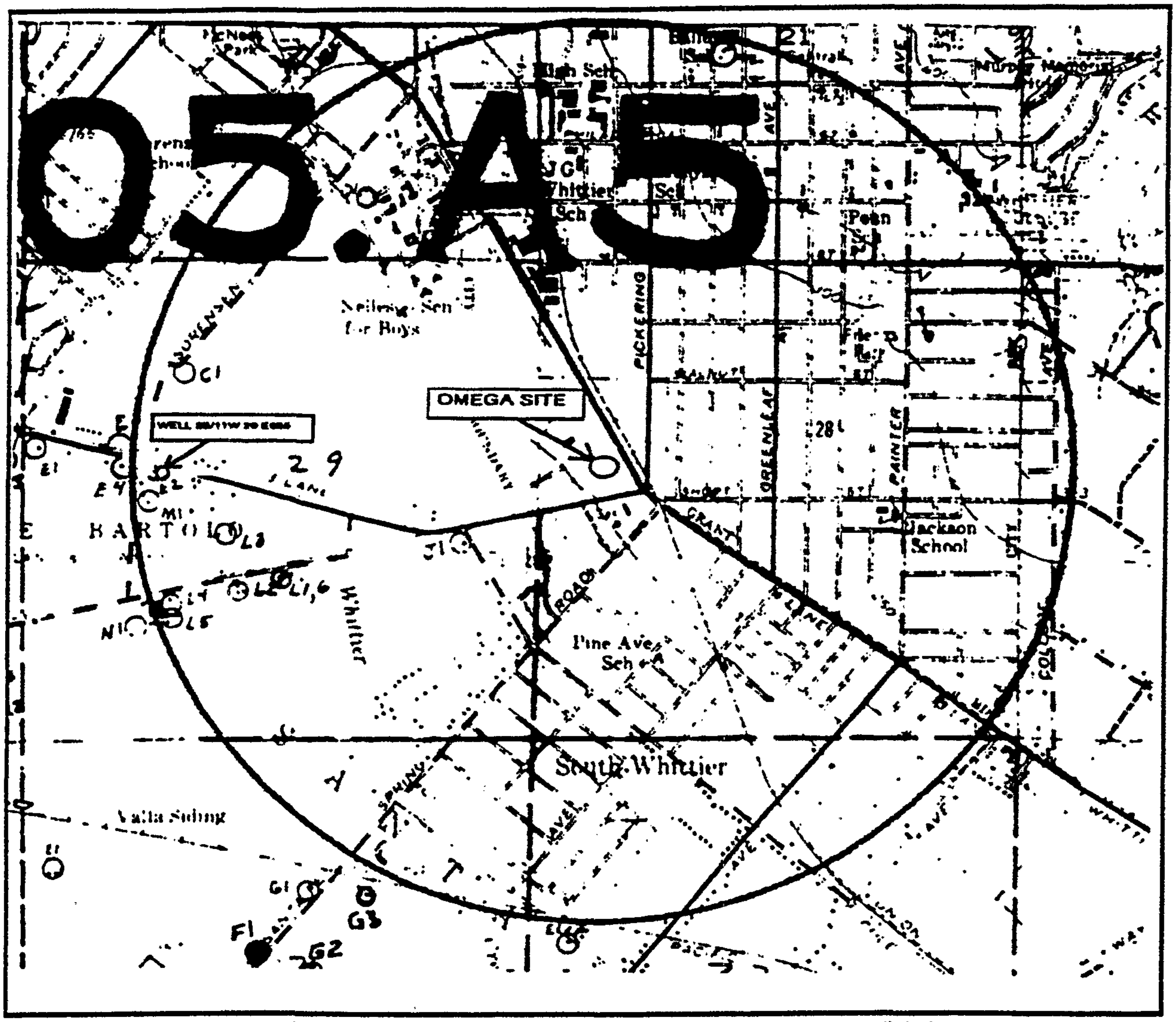
Adopted on Dec. 26, 1973 by Section 9116 of the WHITTIER MUNICIPAL CODE

SECTIONAL DISTRICT MAP

NOV '8

FIGURE II-3

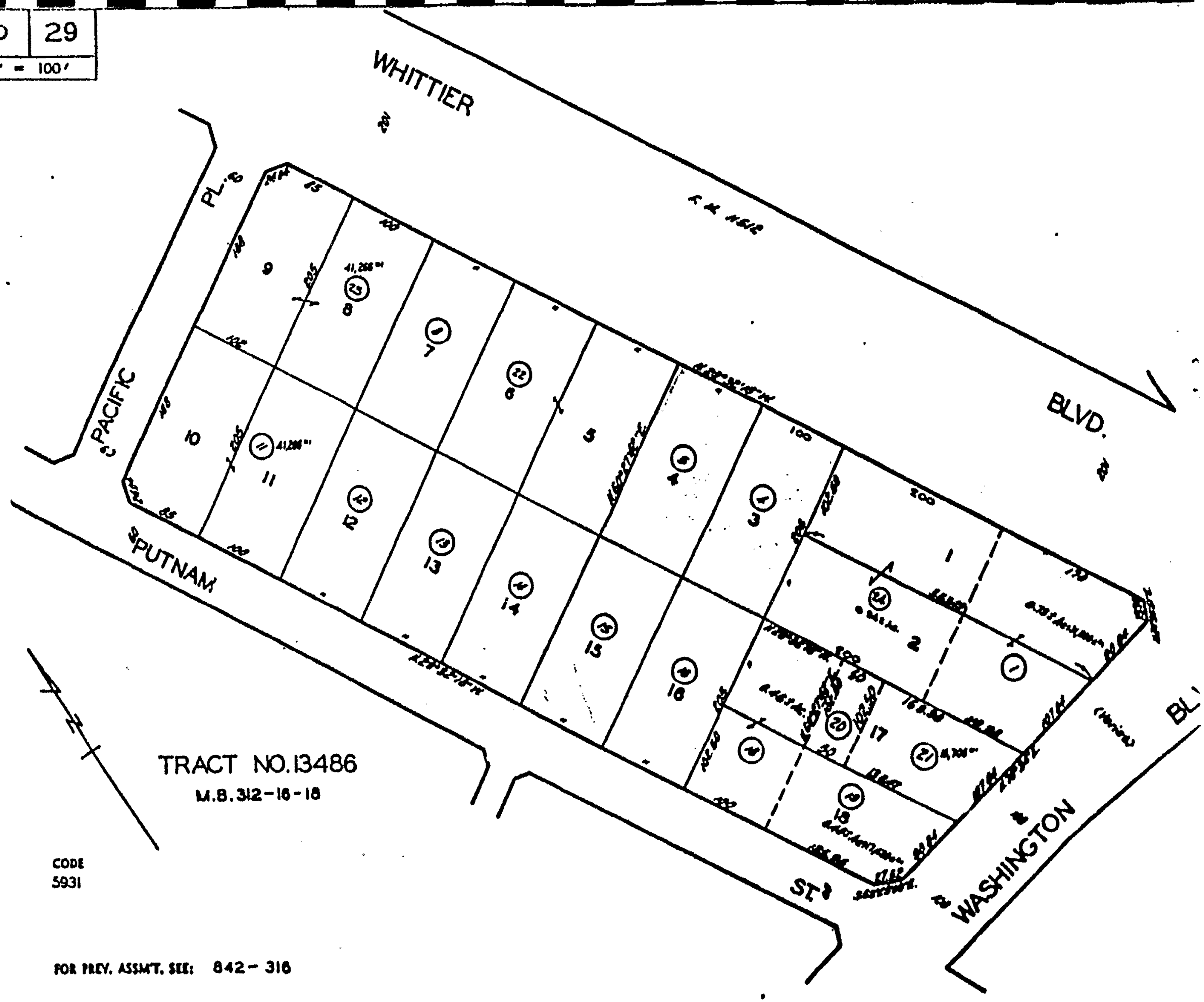
WELL LOCATION MAP FOR THE WHITTIER SITE WITHIN ONE MILE



SOURCE:"Well Location Map from California Water Resources Whittier Quadrangle"

This displays the wells located within one mile radius of the Omega Facility. The Well number 2S/11W 29 05E is marked. This is the only well with water data generated within 10 years.

70	29
1" = 100'	



CODE
5931

FOR PREV. ASSM'T. SEE: 842 – 316

FIGURE II-5

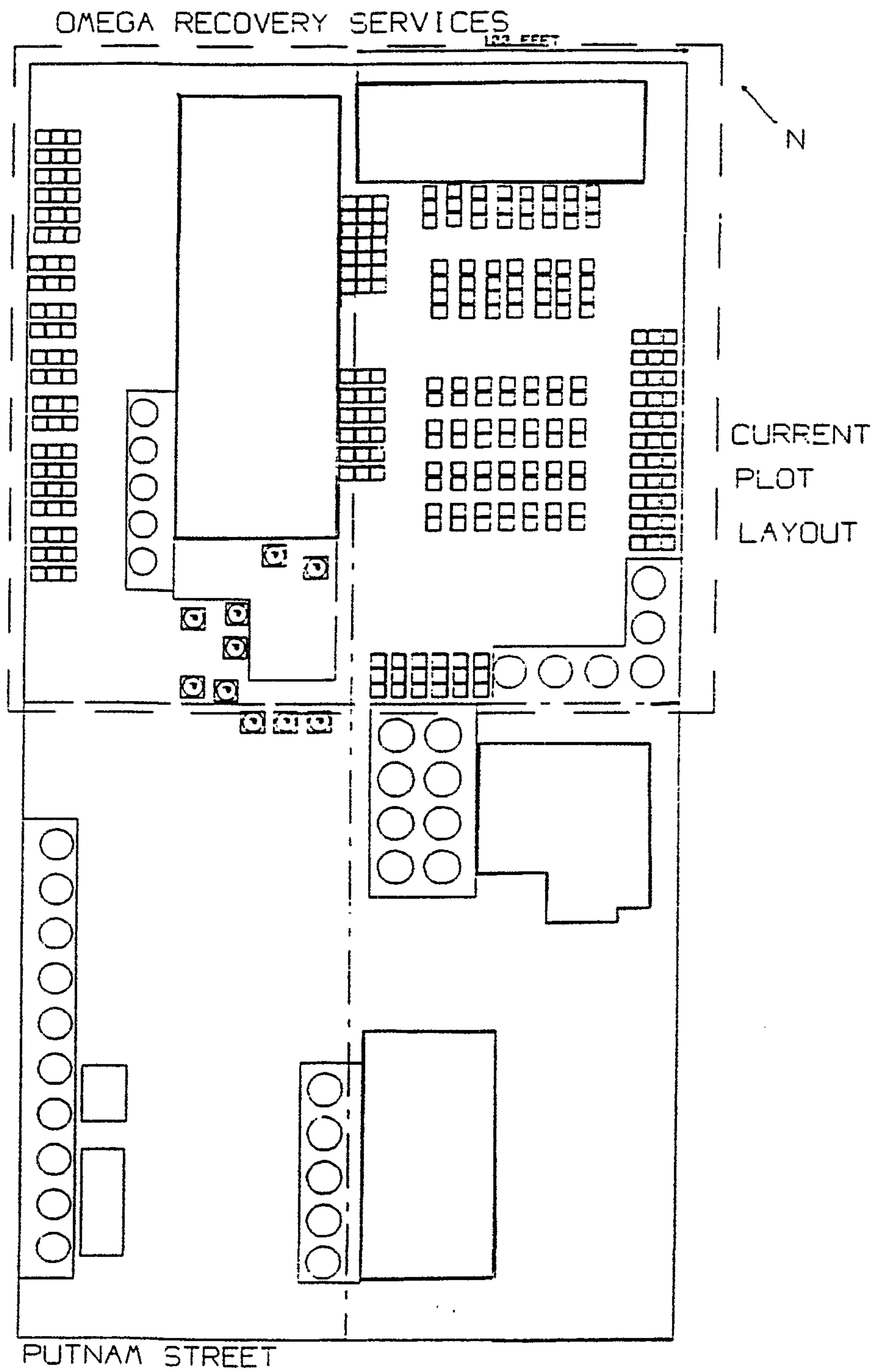
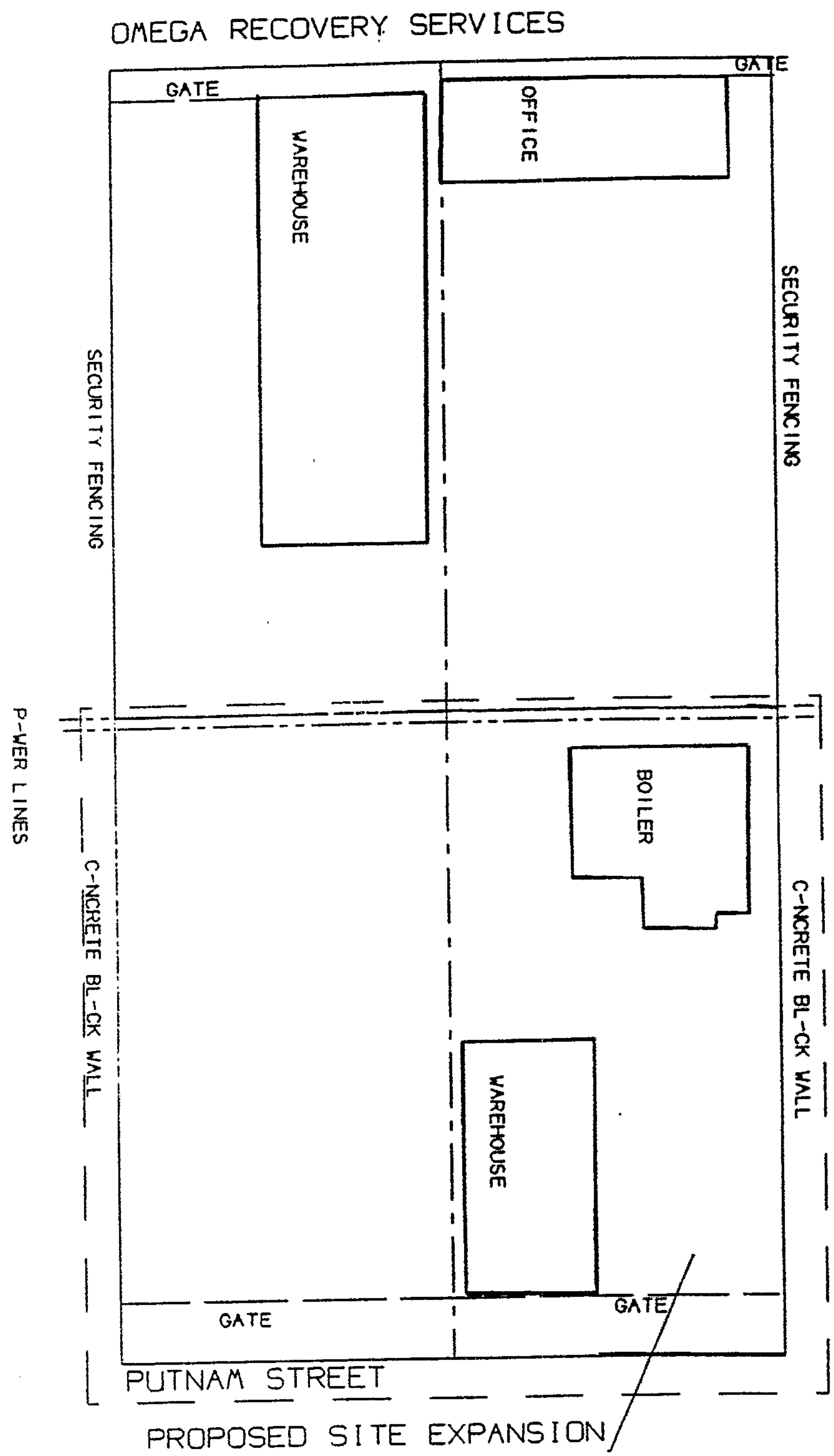
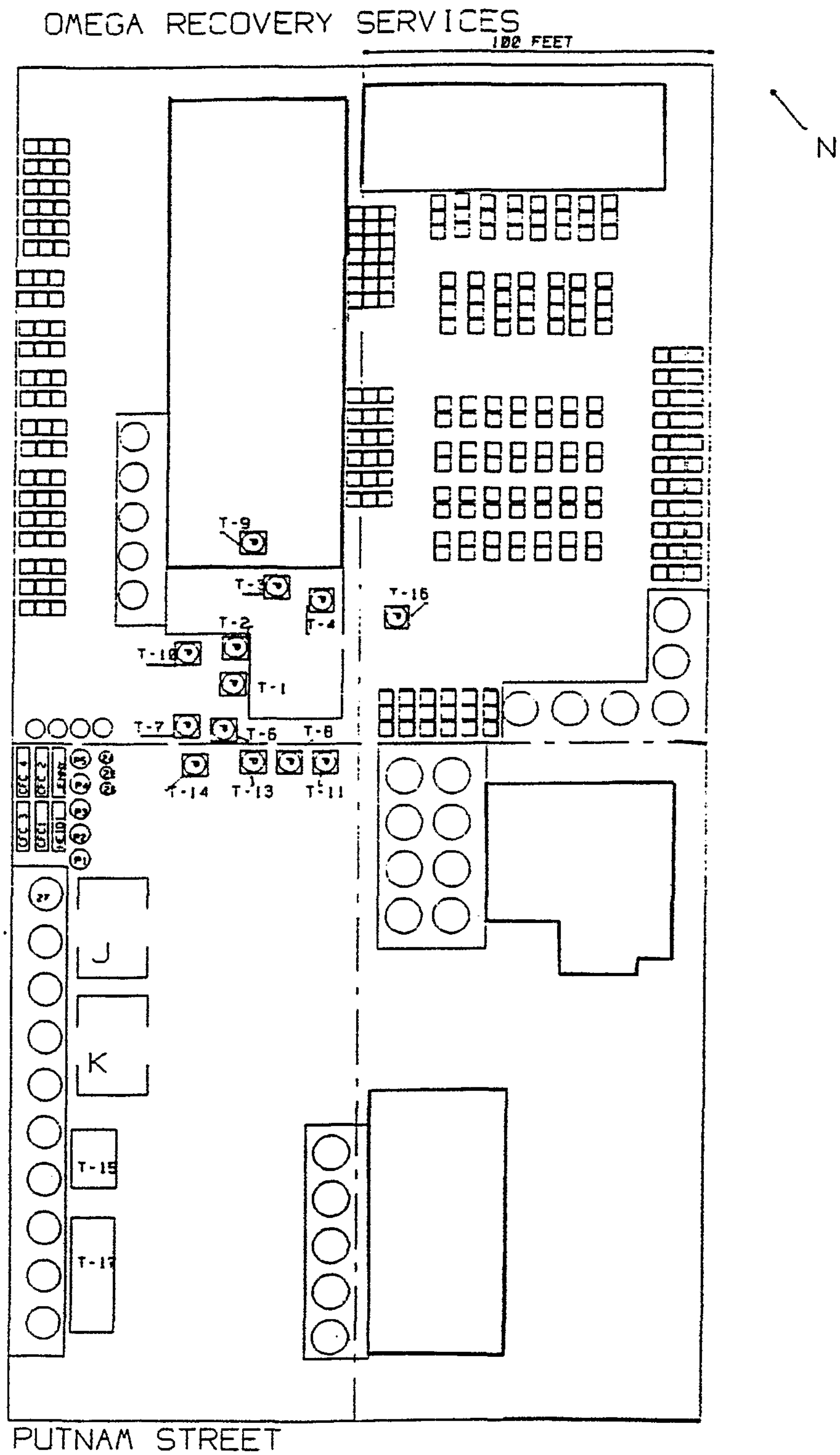

OMEGA RECOVERY SERVICES
100 FEET
N
CURRENT
PLOT
LAYOUT
PUTNAM STREET

FIGURE II-6



OMEGA RECOVERY SERVICES
GATE
GATE
WAREHOUSE
OFFICE
SECURITY FENCING
SECURITY FENCING
P-WER LINES
BOILER
C-NCRETE BL-CK WALL
C-NCRETE BL-CK WALL
WAREHOUSE
GATE
GATE
PUTNAM STREET
PROPOSED SITE EXPANSION

FIGURE II-7


OMEGA RECOVERY SERVICES
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T-4
T-16
T-2
T-10
T-1
T-7
T-6
T-8
T-14
T-13
T-11
J
K
T-15
T-17
PUTNAM STREET

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (818) 458-5100

.HOMAS A. TIDEMANSON, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O.BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

October 31, 1990

IN REPLY PLEASE REFER TO FILE. P-4
2-15.93

Mr. Dennis R. O'Meara, President
Omega Recovery Services
12504 East Whittier Boulevard
Whittier, CA 90602

Dear Mr. O'Meara:

REQUEST FOR FLOOD INSURANCE INFORMATION

In response to your inquiry, the property located at 12504 East Whittier Boulevard, in the City of Whittier, is located in Flood Hazard Zone C. Properties in Zone C do not require flood insurance. This information was determined from the Federal Emergency Management Agency's Flood Insurance Rate Map No. 060169-0002B.

Enclosed is a receipt for your Check No. 00324.

Very truly yours,

T. A. TIDEMANSON
Director of Public Works

Brian T. Swanson

for Carl L. Blum
Assistant Deputy Director
Planning Divison

LV:nr
P-4:1/28

Enc.

Figure II-8

FIGURE II-9

WINDROSE FOR WHITTIER FACILITY

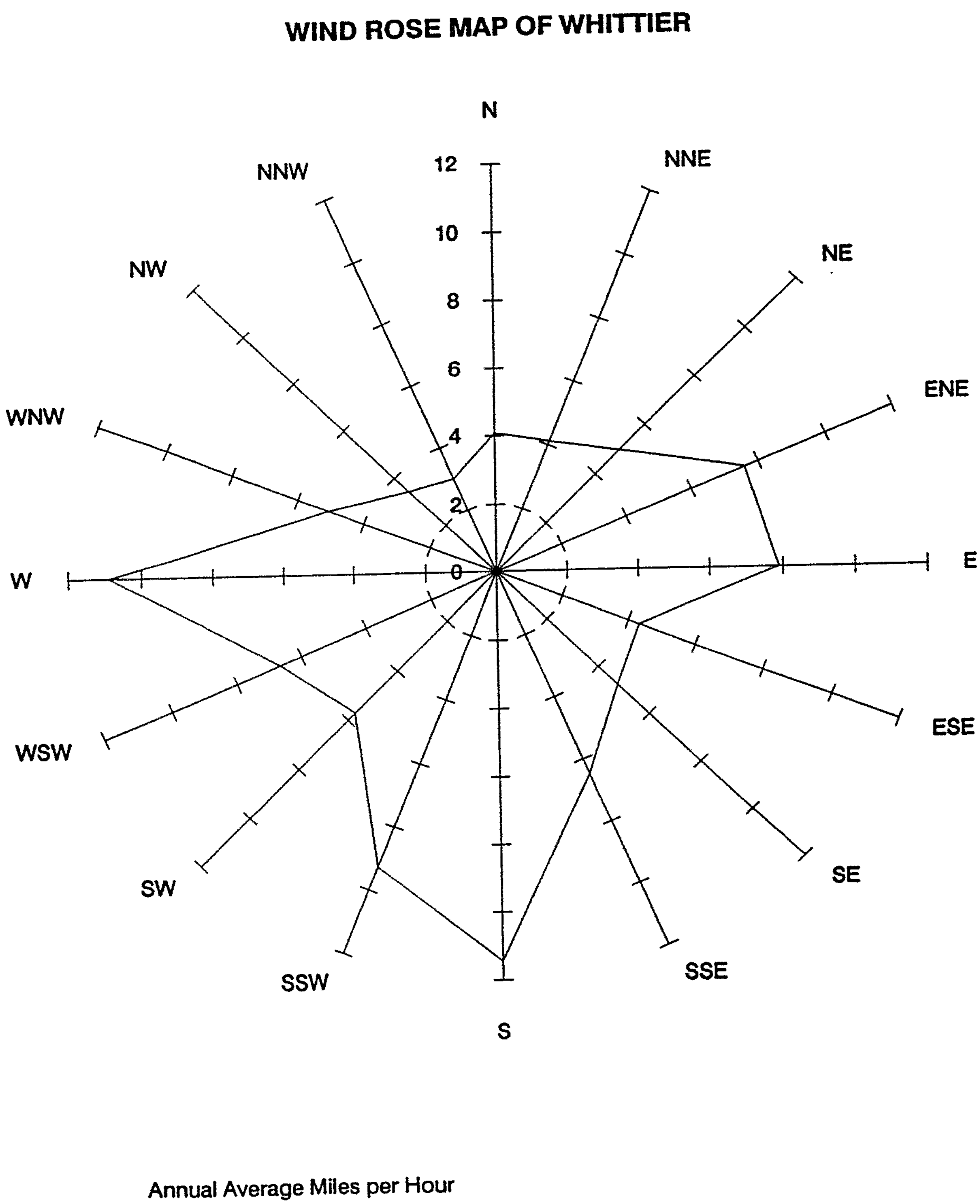

Figure II-9A

Wind Frequency Distribution

Table VI-1. Wind Frequency Distribution (Percent)

	Speed in MPH									
Direction	0-2	2-4	4-7	7-11	11-16	16-22	22-29	29+	TOTAL	MEAN
N	2.22	2.27	0.42	2.09	2.07	0.01	0.00	0.00	4.08	2.96
NNE	2.33	1.37	0.38	0.03	0.01	0.00	0.00	0.00	4.12	2.63
NE	2.58	1.75	0.52	0.08	0.03	0.01	0.00	0.00	4.97	2.95
ENE	3.36	3.22	0.78	0.21	0.04	0.01	0.00	0.00	7.61	3.10
E	3.36	3.29	0.90	0.28	0.09	0.00	0.00	0.00	7.92	3.25
ESE	1.91	1.62	0.61	0.13	0.04	0.01	0.00	0.00	4.31	3.21
SE	2.32	1.79	0.54	0.09	0.03	0.00	0.00	0.00	4.77	2.97
SSE	2.72	2.27	1.24	0.23	0.03	0.00	0.00	0.00	6.48	3.36
S	3.25	3.68	3.65	0.81	0.06	0.01	0.00	0.00	11.45	4.16
SSW	1.69	2.42	3.95	1.14	0.08	0.00	0.00	0.00	9.28	4.97
SW	1.17	1.59	1.83	0.96	0.16	0.00	0.00	0.00	5.71	5.07
WSW	1.28	1.51	2.43	1.12	0.31	0.03	0.00	0.00	6.67	5.51
W	2.94	3.06	3.31	1.17	0.37	0.06	0.00	0.00	10.90	4.72
WNW	2.01	1.59	0.85	0.44	0.16	0.02	0.01	0.00	5.08	4.02
NW	1.23	0.98	0.55	0.43	0.23	0.03	0.00	0.00	3.45	4.72
NNW	1.31	0.99	0.43	0.16	0.10	0.02	0.00	0.00	3.02	3.75
CALMS								0.17		
TOTALS	35.67	32.40	22.38	7.35	1.80	0.21	0.02	0.01	100.00	3.96

Source: SCAQMD Station 114W, 14427 Leffingwell Road, Whittier, 1969-1975.

FIGURE II-10

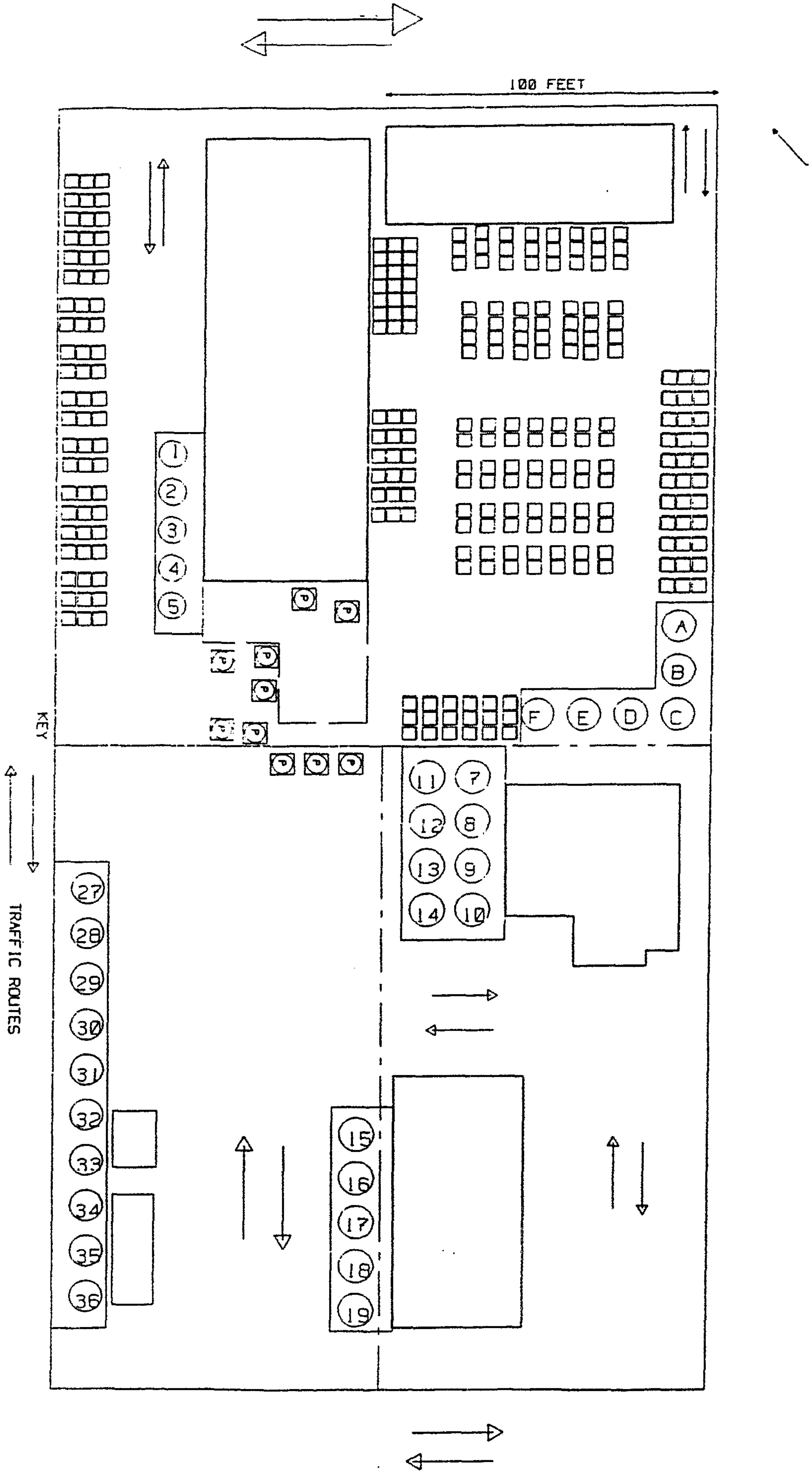
100 FEET
KEY
TRAFFIC ROUTES
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FIGURE II-11

FIGURE II-11 MAJOR STORAGE TANK LOCATIONS

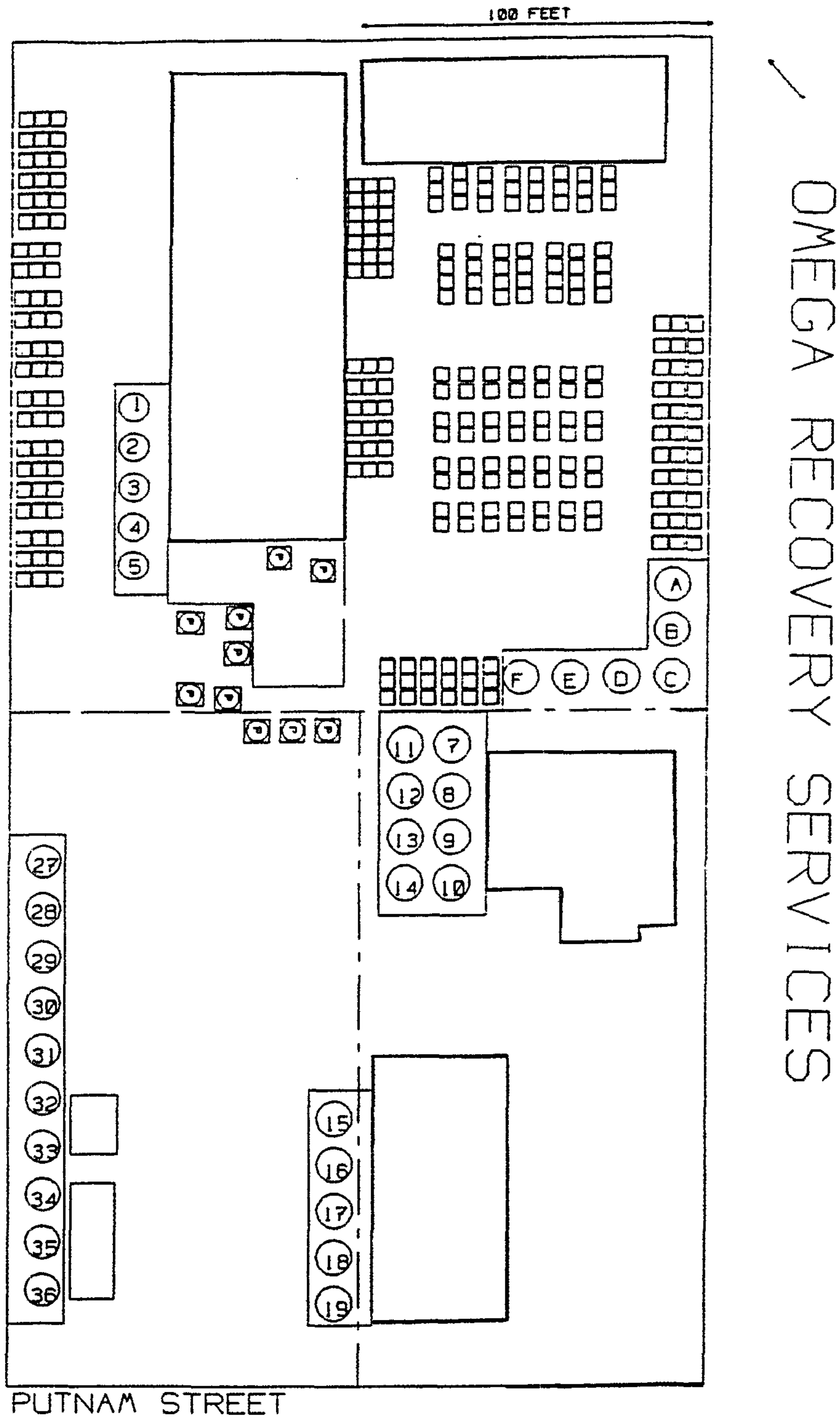

FIGURE II-12

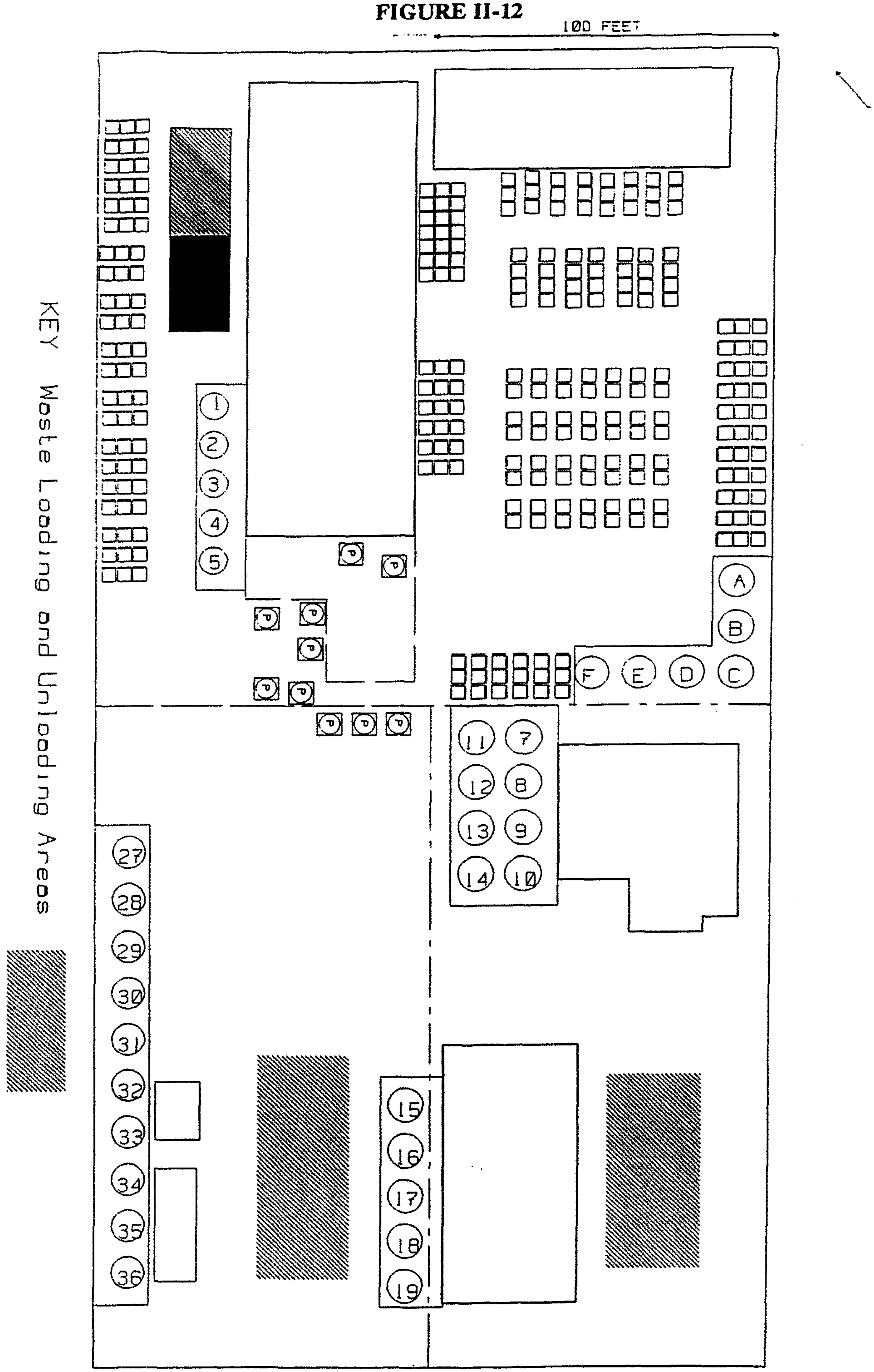
100 FEET
KEY
Waste Loading and Unloading Areas
1
2
3
4
5
A
B
C
D
E
F
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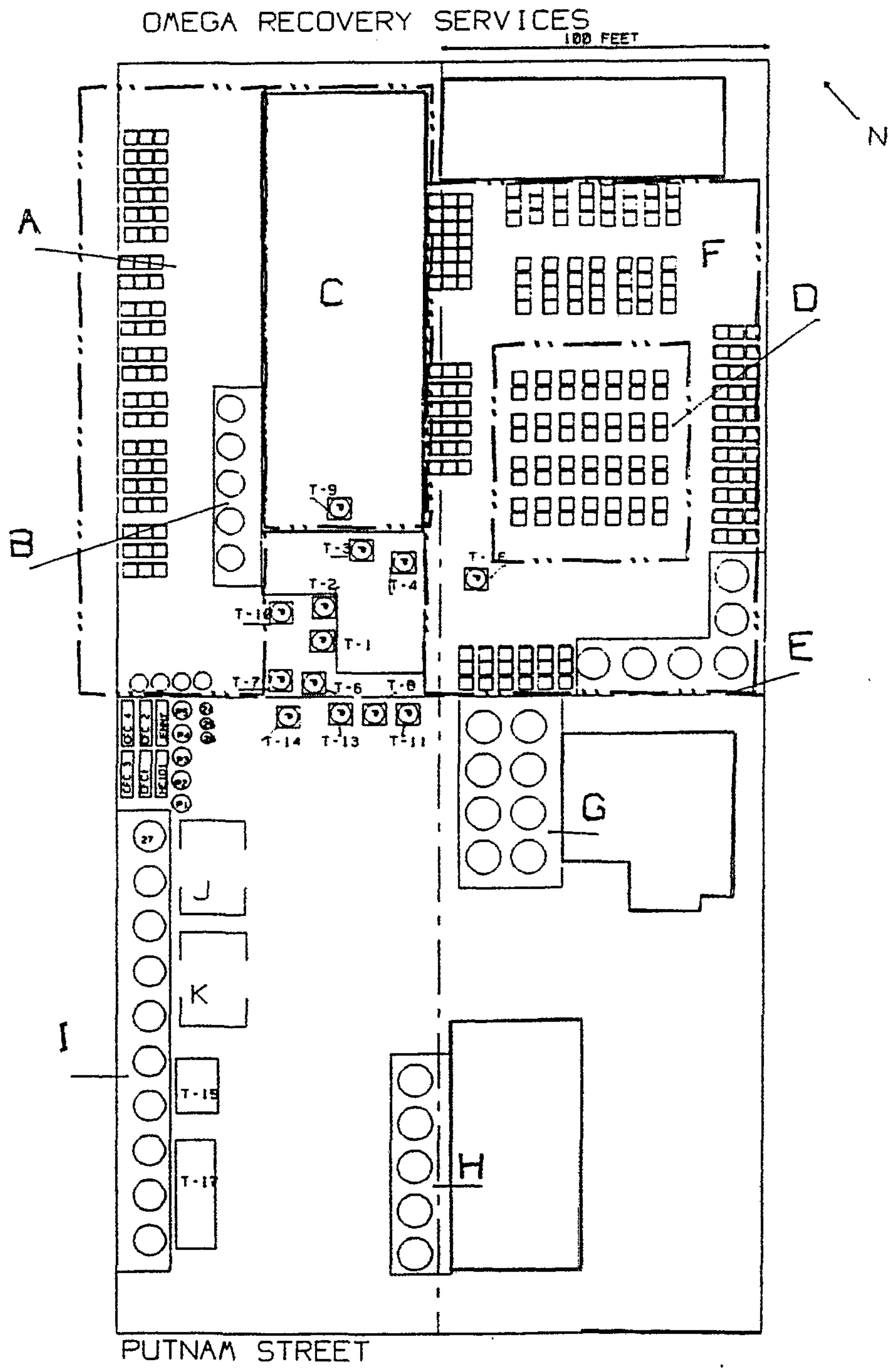
FIGURE II-13



DRUM AND TANK STORAGE LOCATIONS

Figure II-14

RESERVED FOR FUTURE USE

OMEGA RECOVERY SERVICES

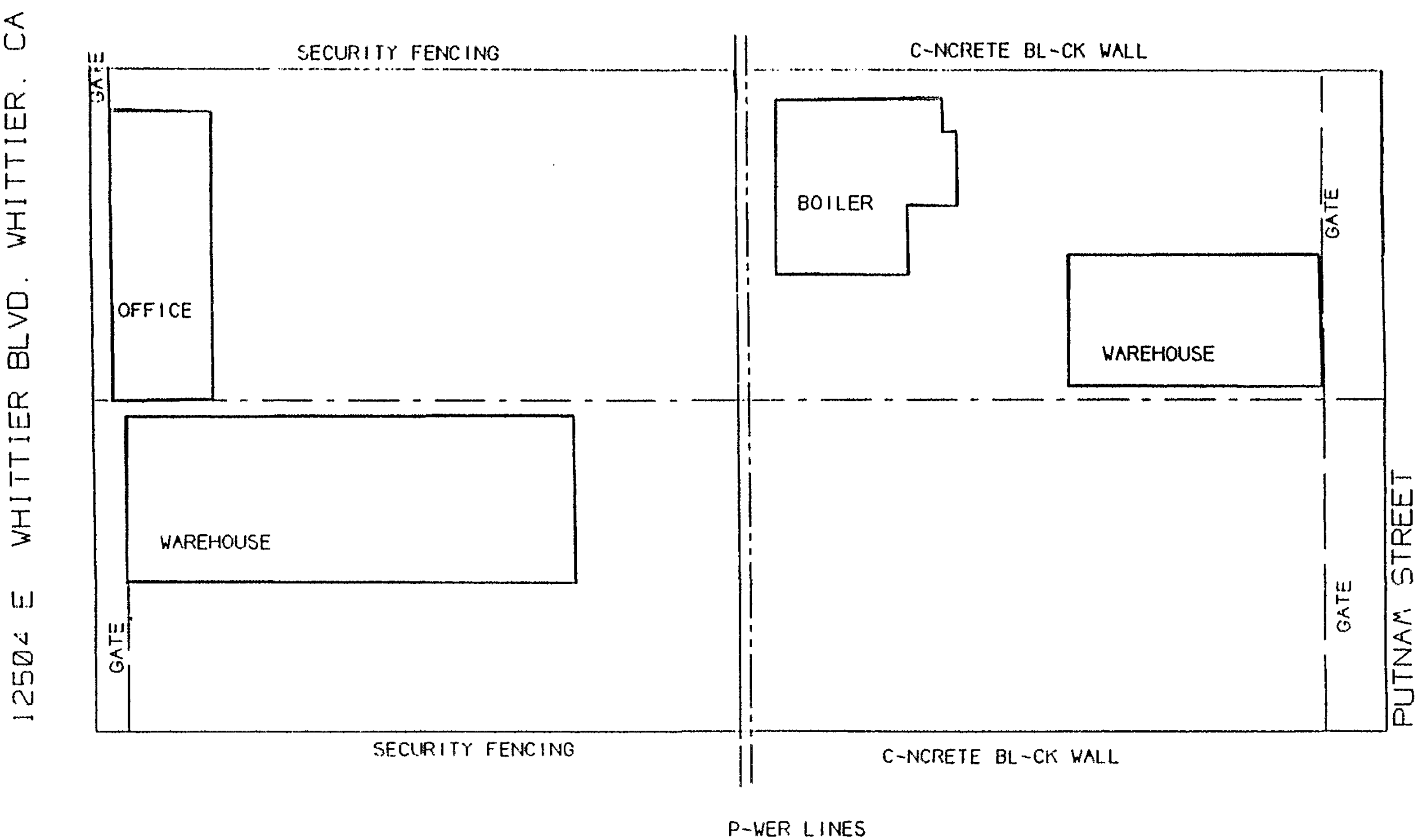
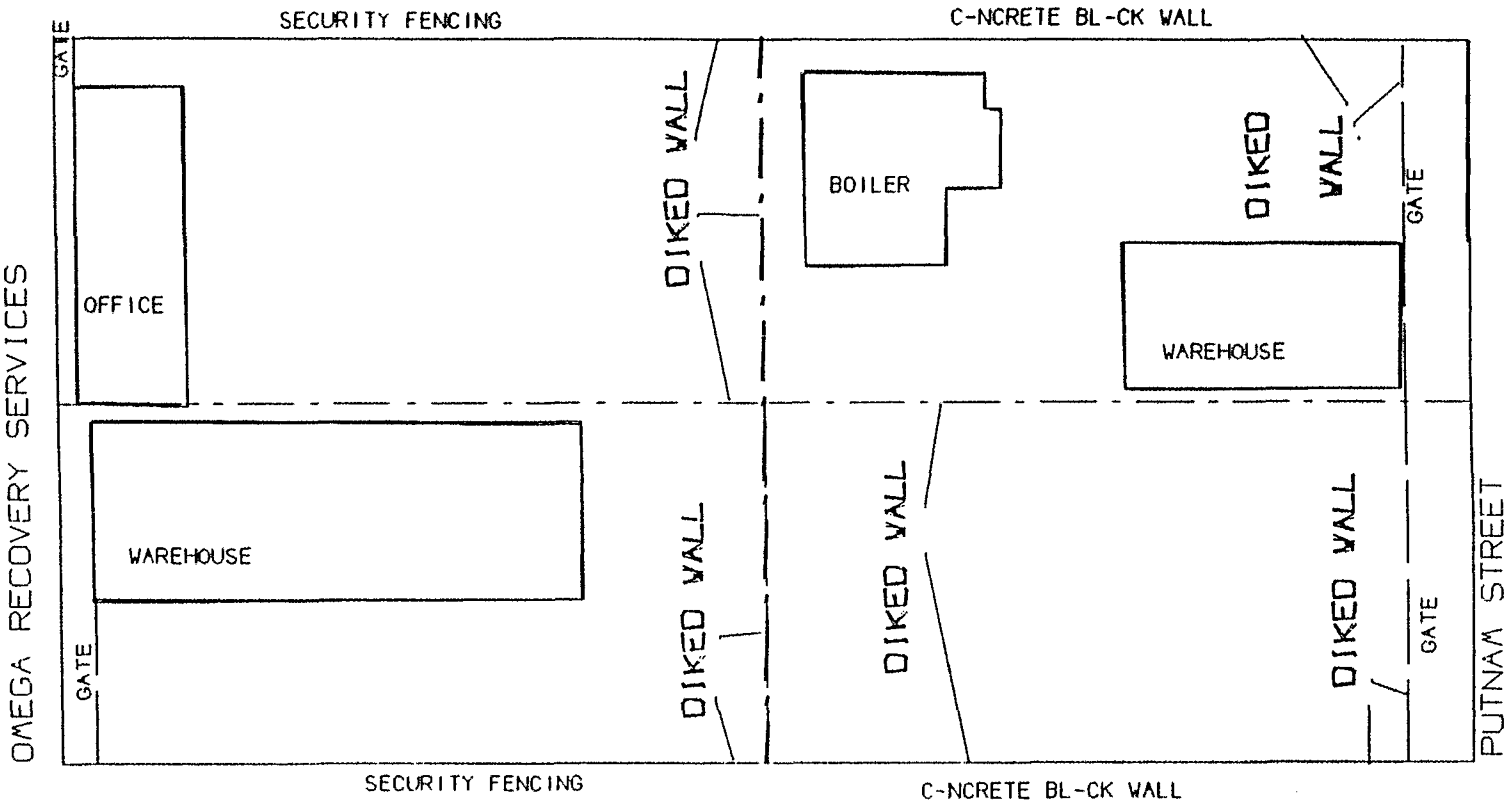


FIGURE II-15

FIGURE II-16


SECURITY FENCING
C-NCRETE BL-CK WALL
GATE
OFFICE
DIKED WALL
BOILER
DIKED
WALL
GATE
WAREHOUSE
OMEGA RECOVERY SERVICES
WAREHOUSE
DIKED WALL
DIKED WALL
DIKED WALL
GATE
GATE
PUTNAM STREET
SECURITY FENCING
C-NCRETE BL-CK WALL

OMEGA RECOVERY SERVICES

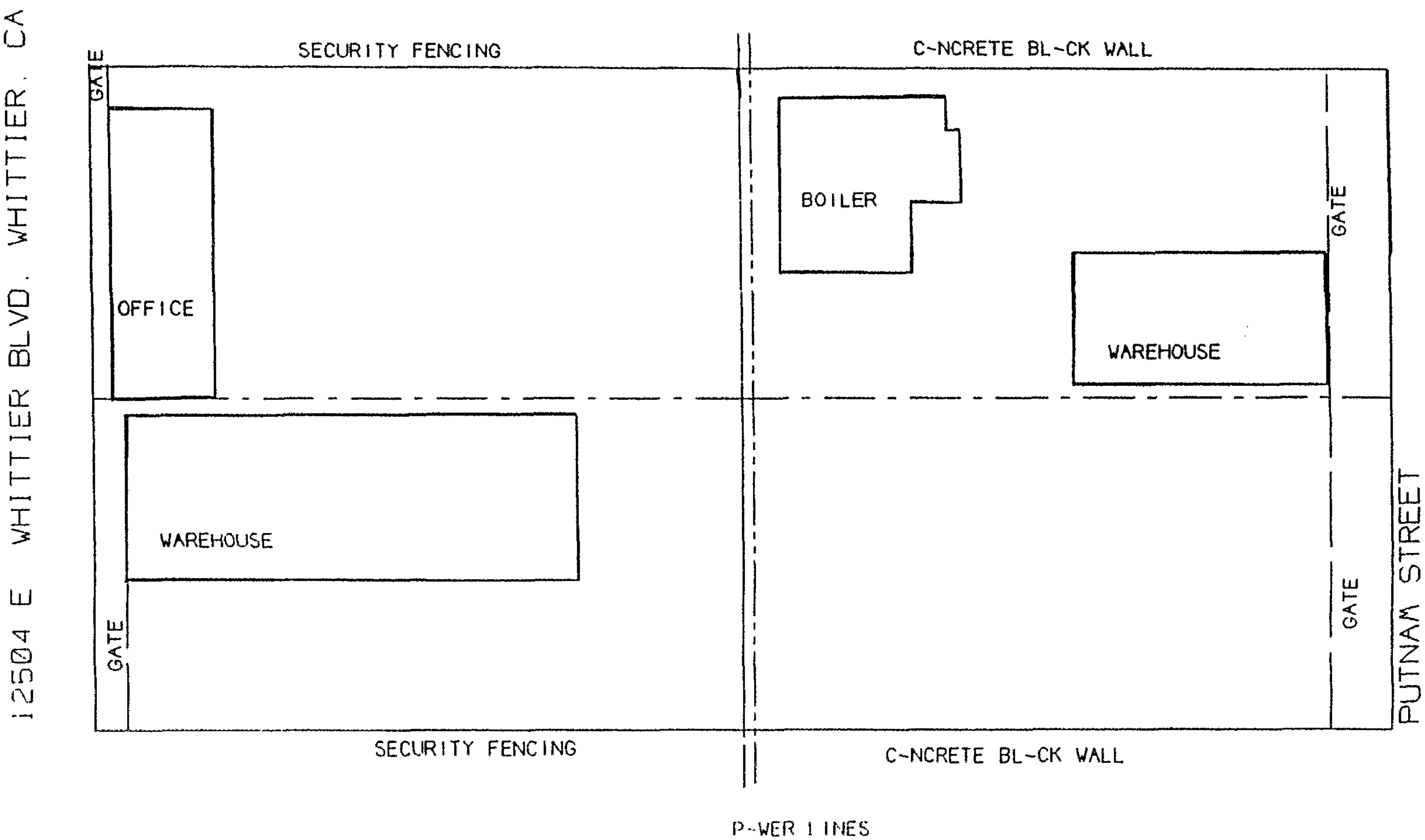


FIGURE II-17

Figure II-18
Property Tax Records showing
Omega owner of property 1990

JOINT CONSOLIDATED ANNUAL TAX BILL

CITIES, COUNTY, SCHOOLS AND ALL OTHER TAXING AGENCIES IN LOS ANGELES COUNTY
SECURED PROPERTY TAX FOR FISCAL YEAR JULY 1, 1990 TO JUNE 30, 1991
SANDRA M. DAVIS, TREASURER AND TAX COLLECTOR

COUNTY OF LOS ANGELES

OWNER OF RECORD AS OF MARCH 1, 1990
SAME AS BELOW

8170 029 005
OMEGA CHEMICAL CORP
12504 E WHITTIER BLVD
WHITTIER CA 90602

PROPERTY LOCATION AND / OR PROPERTY DESCRIPTION
12504 WHITTIER BLVD WHITTIER C
TRACT NO 13486 LOT 4

ACCOUNT NO	PRINT NO.	REG.	DIVISION INDEX BATCH NO	ASSESSOR'S ID. NO. Year	Seq. No.	Map Book	Page	Parcel	TRA
	643930	11		90	000	8170	029	005	05931

OMEGA CONFIDENTIAL

ROLL YEAR 90-91	CURRENT ASSESSED VALUE		TAXABLE VALUE
LAND	188190		188190
IMPROVEMENTS	48898		48898
FIXTURES			
		TOTAL	237088
		LESS EXEMPTION	
		NET TAXABLE VALUE	237088

DETAIL OF TAXES

GENERAL TAX
ALL AGENCIE

VOTED INDEBT
COUNTY
FLOOD CONTR
METRO WATER

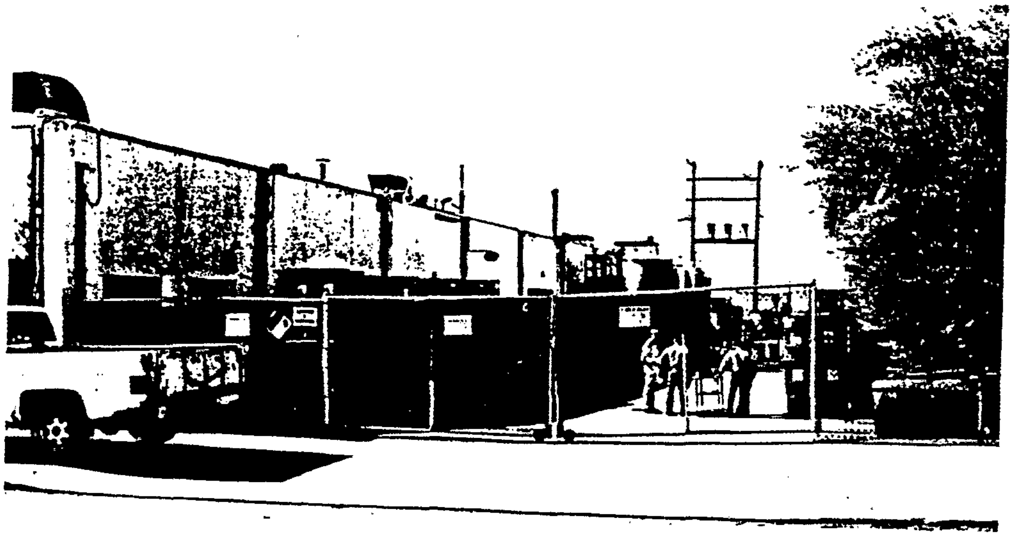
DIRECT ASSES
FLOOD CONTR
MOSQUITO AB
SAN DISTRIC
CITY SEWER

FIGURE II-19

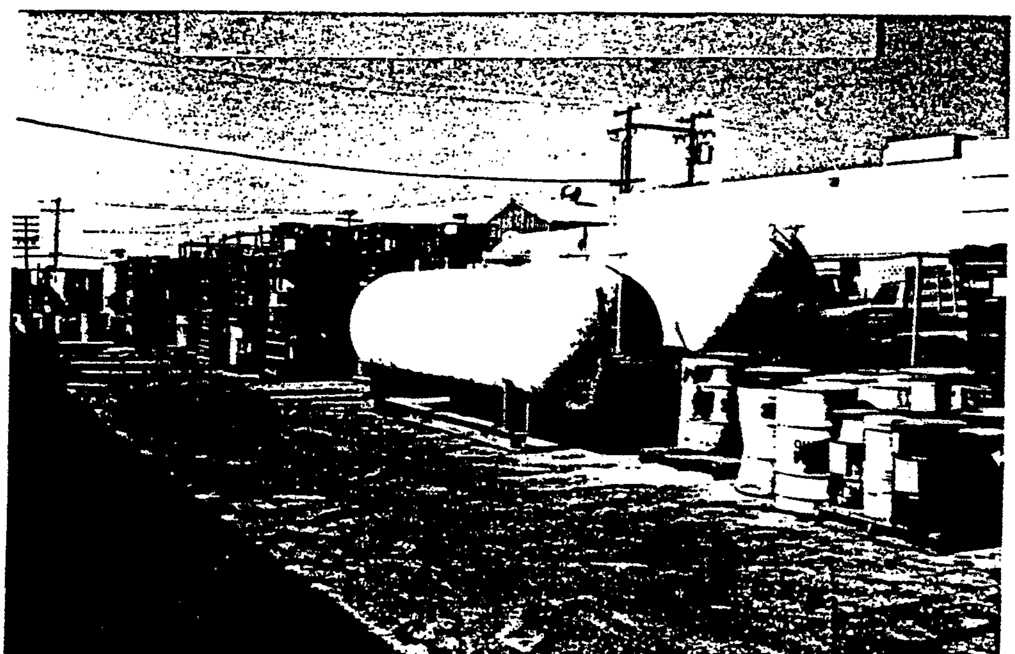
PHOTOGRAPH ESSAY OF CURRENT FACILITY

Title: Front View of Administration Bldg on Whittier Blvd

Title:Front View of Warehouse Bldg on Whittier Blvd.

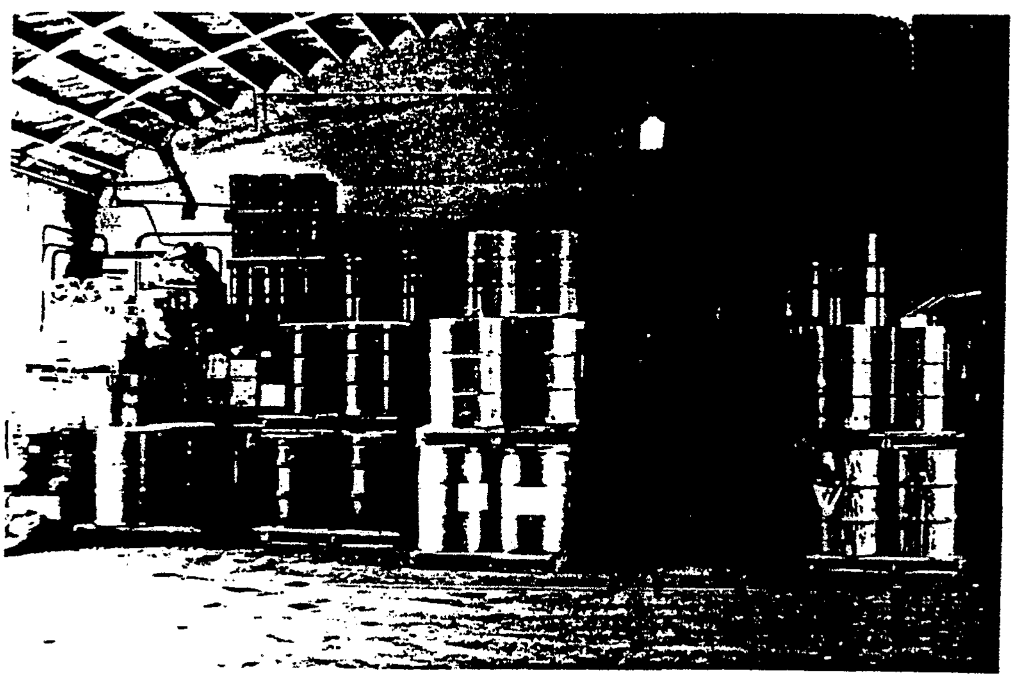


Title: Front View of Main Gate on Whittier Blvd



Title: View of Receiving Area on Whittier Blvd.

Title: Looking North Inside Warehouse on Whittier Blvd



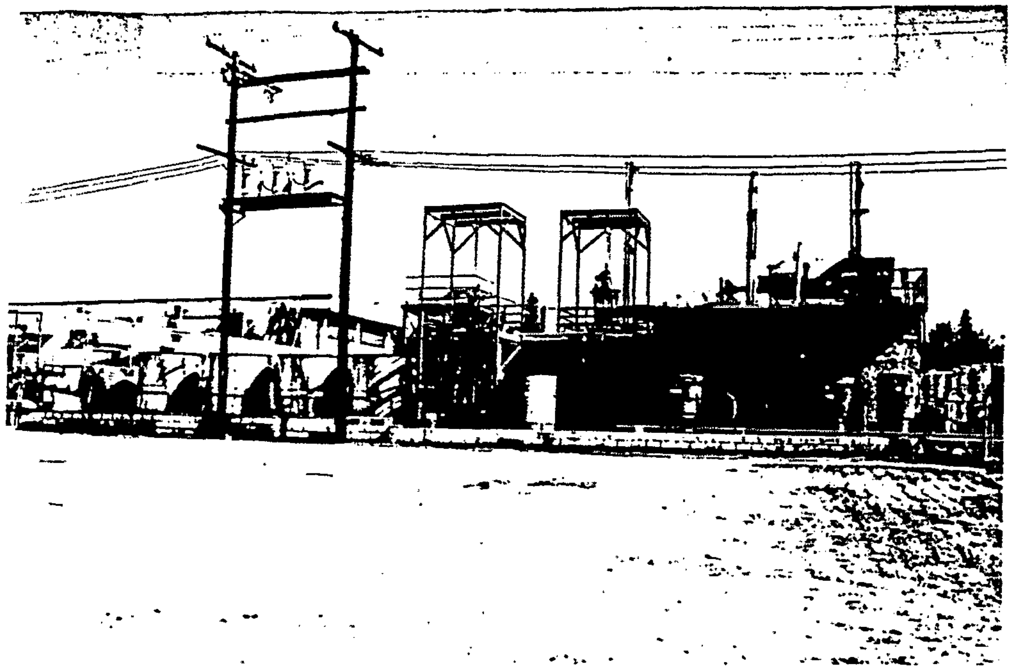
Title: Looking South Inside Warehouse on Whittier Blvd.

Title: Looking North Drum Storage South Yard

Title: Looking West in Drum Storage South Yard.

Title: 10,000 Gallon Tanks in South Yard

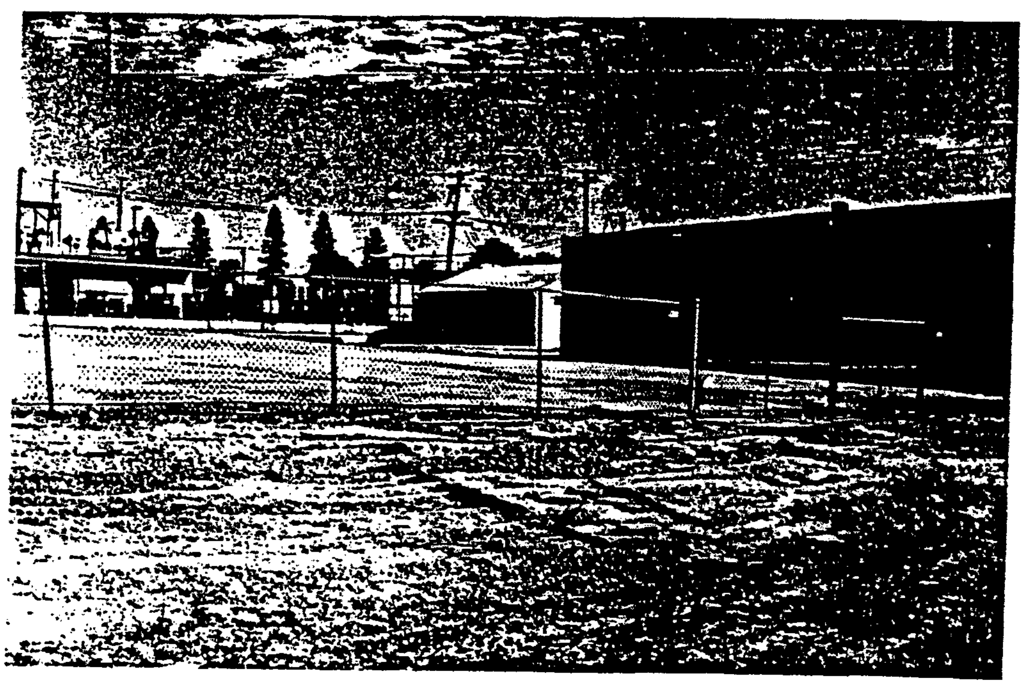
Title: Looking East in Drum Storage South Yard.



Title: Looking North from Proposed Treatment Facility

Title: Looking East from Proposed Treatment Facility Expansion.

Title: Looking North from Proposed Treatment Facility Expansion on Putnam St.



Title: Looking East from Proposed Treatment Facility Expansion on Putnam St..

PHOTO: ENGINEERING-SCIENCE

CLOSE-UP OF PROCESS EQUIPMENT

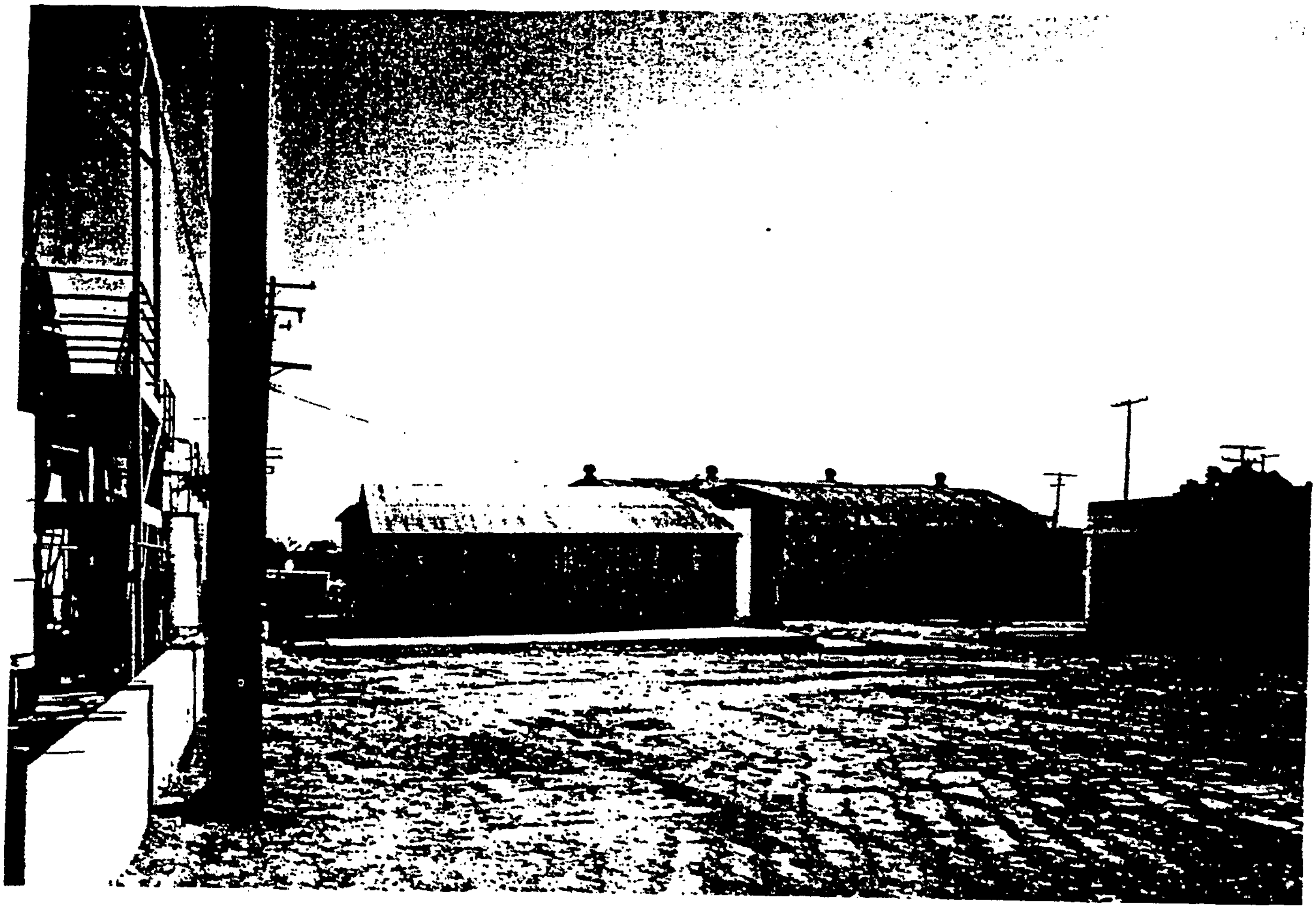


PHOTO: ENGINEERING-SCIENCE

PROPOSED EXPANSION SITE

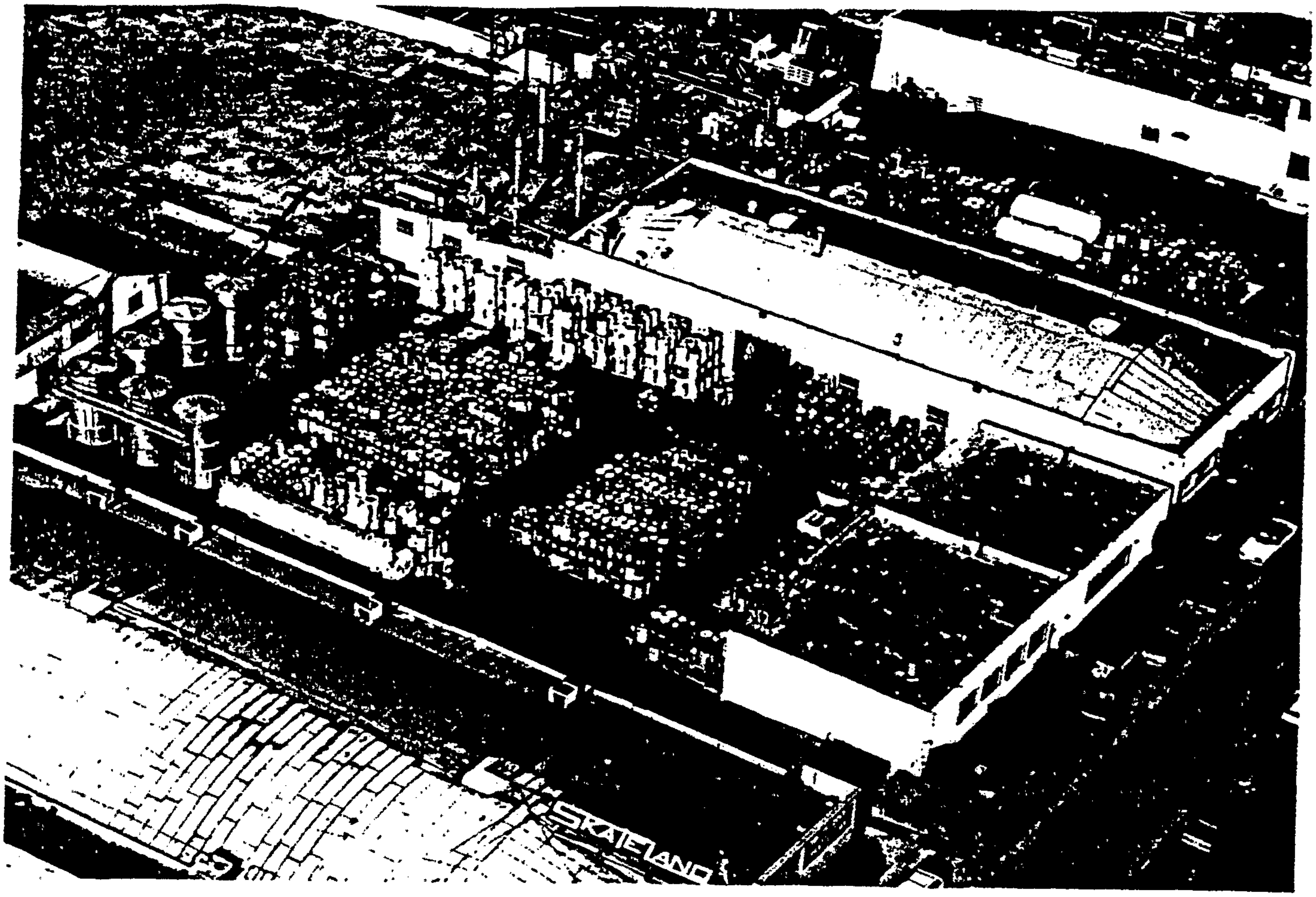
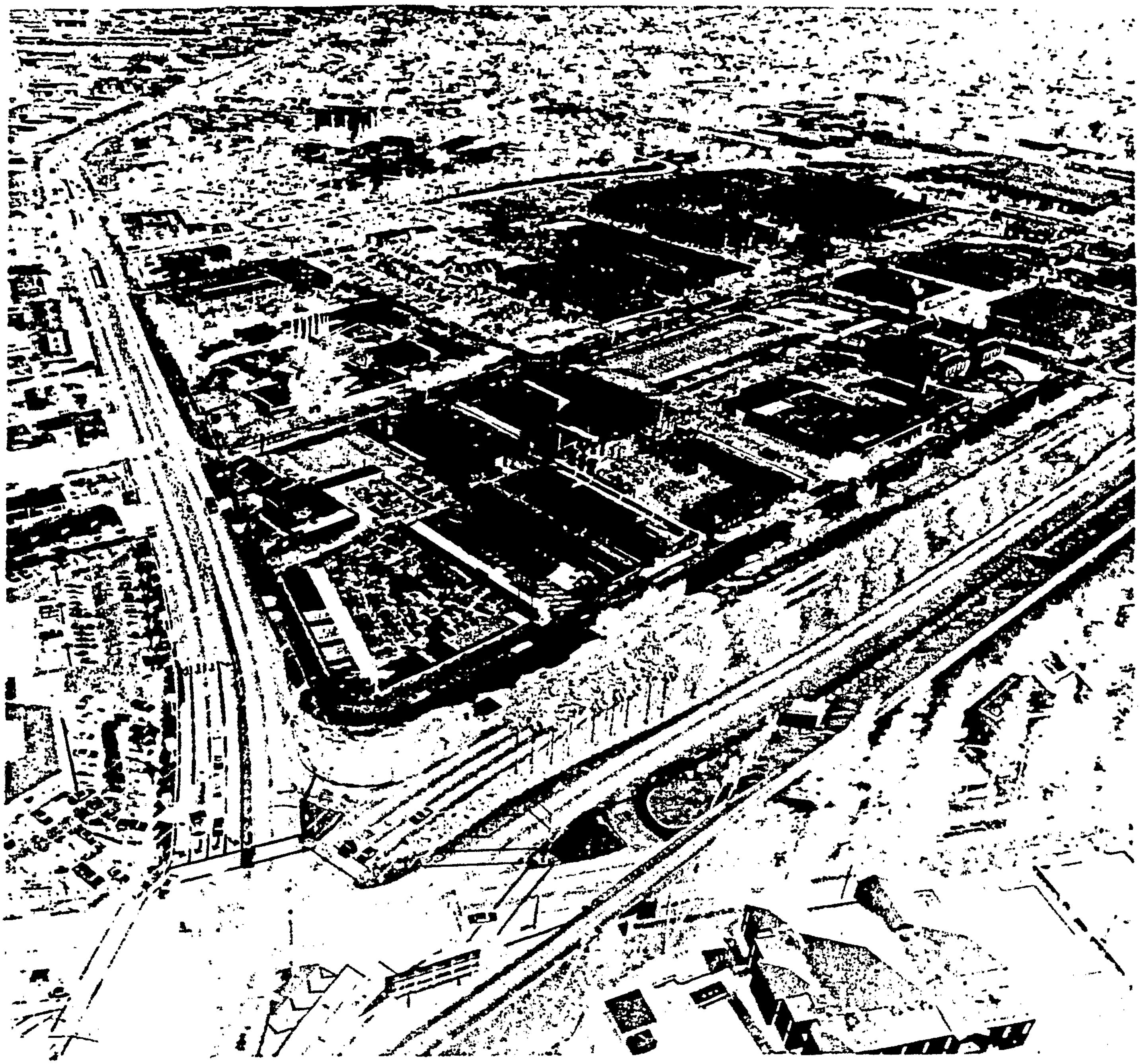


PHOTO: ENGINEERING-SCIENCE

EXISTING FACILITY



AERIAL PHOTO: ENGINEERING-SCIENCE

OMEGA RECOVERY SERVICES EXPANSION

III. GEOLOGY OF THE SITE

The climate of the Whittier Area which is part of the San Gabriel Valley is categorized as semi-arid with an average annual rainfall of between 13 to 20 inches. Precipitation occurs mainly during the winter and spring months. The National Oceanic and Atmospheric Association (NOAA) climatological station nearest to the facility is located in Whittier.. This station has compiled many decades of of meteorological records. The average annual precipitation at the station is 15.43 inches, and ranges from a low of 4.86 inches to a high of 36.73 inches. A 24-hour/25-year storm event of 5.61 inches (0.47 feet) has been estimated from station records (see Figure III-1). The average monthly temperatures in the San Gabriel Valley range from 41°F to 89°F (see Figure III-1).

The combination of climate and alluvium supports only sparse yucca-sumac types of vegetation near the facility.

III.A. GEOLOGY

The Omega facility is located within the greater San Gabriel Valley, which is physiographically defined to the north by the San Gabriel Mountains, to the north by the Puente-Repetto Hills Complex.

The geology beneath the facility consists of thick series sandstone, siltstone, and conglomerate beds west of Hacienda Boulevard is named tentatively as middle Puente. It represents a facies change of the eastern section with coarsening to the west The distinction in the lithology of the two eastern units disappears in the west as the amount of coarset material increases. A fault of unknown displacement as shown on the Figure III-2 accentuates the difference between the series east and the series west of Hacenda.

The top of the western section is the base of a medium grained brown sandstone approximately 50 feet thick marking a change in lithology to the thinly bedded upper Puente sandstone and siltstones of the overlying beds.

III.B HOLOCENE FAULTS AND SEISMICITY

There is the Whittier Fault which is located over 3000 feet from the Omega facility and the site is not located within an Alquist-Priolo Special Studies Zone (see Figure III-8). The dominant structural feature of the San Gabriel Valley area is the frontal fault zone termed the Sierra Madre Fault Zone, along which the San Gabriel mountains have been uplifted. Further study shows that there are no faults within 200 feet of the Omega facility.

The Puente Hills are essentially a west trending anticline that is complicated by secondary folding and faulting. The predominant structural feature of the Puente Hills is the Whittier fault or fault zone. This major structure trends southeast along the south flanks of the Puente Hills and extends from the vicinity of the Whittier Narrows into Orange County. Northeast of the City of Whittier, the principal fault separates into a complex of smaller breaks and probably diminishes as it approaches the Whittier Narrows. Available oil well data indicate that it is a high angle reverse fault, with the north side rising over the south side at an angle of approximately 70 degrees. Offset drainage of La Mirada Creek and Turnbull and Brea Canyons in Orange County suggest that right lateral displacement has occurred along the fault in relatively late geologic time, the southwest side having moved several thousand feet northwest relative to the north east side.

The Puente Hills have been uplifted by vertical displacemetn along the Whittier fault and by normal faulting along the Workman Hill, Handorf and Rowland fault systems. The hills are further characterized structurally by minor faults, unconformities, and tight and overturned folds in sediments of Miocene, Pliocene and Pleistocene age. South of the Whittier fault zone, an angular unoconformity exists between Pico and overlying San Pedro sediments, but both formations have a general southerly homoclinal dip on the LaHabra syncline.[1]
Source: Geology of Whittier-LaHabra Area, State of California Department of Natural Resources, Special Report 18, March 1952, Out of Print.

Figure III-3 shows that the closest fault to the site is the Whittier Fault which is over 2 miles from the facility.

Since all the processing and treatment is done in tanks aboveground. All the tanks have secondary containment. Therefore the potential for groundwater contamination is an extremely rare possibility. The groundwater is below 200 hundred feet. This further establishes the geology of the site to being safe and proper for operation of a resource recovery facility

IIIC: GROUNDWATER DEPTH

A information for the depth to Ground water was obtained from California Department of Water Resources, Los Angeles Division. A search of the records provided the following data. A well location map for the Whittier Quadrangle showed that there is only one active well that lists data that is within one mile radius of the site. (See Figure III-4). The data from the well data is shown in Table III-1. This well is not being used for water use.

The depth to ground water is shown in Figure III-5 which is taken from the "Ground Water Geology of the Coastal Plain of Los Angeles County Appendix A". This was published in June 1961 by Department of Water Resources as Bullentin #104. It is now out of print. It shows the various depths to different aquifiers under the Omega site. The depth to the Jefferson Aquifier is approximately 300 feet. The depth to the Lynwood Aquifier is over 400 feet.

Figure III-6 Location of Aquifers

Figure III-7 Groundwater Contours

1 Sources for the information were obtained from the following:
"Geology of the Whittier- La Habra Area, Los Angeles, County" by Charles Kundert, published by Division of Mines Department of Natural Resources of California, Special Report 18, March 1952. This document is out of print.
"Geology & Oil Resources of the Western Puent Hills Area", by R. F. Yerkes, published by the US Geological Division, Professional Paper 420C 1972. This document is out of print
"Geologic Map of California", published by the Resources Agency of California, 1977.
"Map Showing Late Quantum Faults of LA Region" Published by US> Geological Division, Map MF1964

TABLE III-1 WATER DATA FROM WELL NUMBER 2S/11W 29E5

Specification	June 1987	June 1984
Dissolved Hardness	329 mg/l	429 mg/l
Dissolved Calcium	97.7 mg/l	122 mg/l
Dissolved Magnesium	19.7 mg/l	29.7 mg/l
Dissolved Sodium	74.8 mg/l	57.0 mg/l
Dissolved Potassium	4.4 mg/l	3.9 mg/l
Total Alkalinity as Calcium Carbonate	179 mg/l	172 mg/l
pH	7.7	7.8
Sulfate	164 mg/l	217 mg/l
Chlorine	75.0 mg/l	91.0 mg/l
Nitrate	N/A	19.9 mg/l
Fluorine	0.3 mg/l	0.3 mg/l
Boron	0.23 mg/l	.18 mg/l
Dissolved Solids	570 mg/l	690 mg/l
Conductance	950 mohms	1050 mohms
Dissolved Silica	1101 mg/l	1101 mg/l

Figure III-1
Climatological Data

The closest station of National Oceanic And Atmospheric Association station is the County of Los Angeles Fire Station located in City of Whittier.

The data is obtained from the National Climatological Data Center in Ashville, North Carolina.

The average annual precipitation at the station is 15.43 inches.
The lowest precipitation of the last 25 years is 4.86 inches
The highest precipitation of the last 25 years is 36.73 inches.

Mean Precipitation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
mean	3.34	2.88	2.51	1.27	.23	.04	.01	.1	.24	.30	1.96	2.55	15.43

The maximum precipitation for a 24 hour duration is 5.61 inches.

The average monthly temperatures for San Gabriel Valley range from 41^{o} F to 89 ^{o}F.
Temperature Normals (Deg. ^{o}F)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Max	68.3	70.4	71.2	74.1	77.0	82.1	89.1	89.3	87.9	82.0	74.9	69.9	78.0
Min	41.3	42.9	44.9	47.8	52.2	56.3	60.4	61.1	58.6	53.0	45.9	41.3	50.5
Mean	54.8	56.7	58.1	61.0	64.6	69.2	74.8	75.2	73.3	67.5	60.4	55.6	64.3

The air quality is shown in Figure III-1A from the South Coast Air Quality Management District.

Source/ Receptor Area No.	Location of Air Monitoring Station	Carbon Monoxide: Max. Conc. in PPM 1-Hour	Carbon Monoxide: Max. Conc. in PPM 8-Hour	Carbon Monoxide: No. Days Standard Exceeded, Federal ≥ 9.5 PPM 8-Hr.	Carbon Monoxide: No. Days Standard Exceeded, Federal > 35 PPM 1-Hr.	Carbon Monoxide: No. Days Standard Exceeded, State ≥ 9.1 PPM 8-Hr.	Carbon Monoxide: No. Days Standard Exceeded, State > 20 PPM 1-Hr.	Ozone: Max. Conc. in PPM 1-Hour	Ozone: No. Days Standard Exceeded, Federal > .12 PPM 1-Hour	Ozone: No. Days Standard Exceeded, State > .09 PPM 1-Hour	Nitrogen Dioxide: Max. Conc. in PPM 1-Hour	Nitrogen Dioxide: Average Compared to Federal Standard a), AAM in PPM	Nitrogen Dioxide: Average Compared to Federal Standard a), % Above Std.	Nitrogen Dioxide: No. Days Std. Exc'd. State > .25 PPM 1-Hour	Sulfur Dioxide: Max. Conc. in PPM 1-Hour	Sulfur Dioxide: Max. Conc. in PPM 24-hour	Sulfur Dioxide: Average Compared to Federal Standard b), AAM in PPM	Sulfur Dioxide: No. Days Std. Exc'd. c) Federal > .14 PPM 24-Hr.	Sulfur Dioxide: No. Days Std. Exc'd. c) State ≥ .05 PPM 24-Hr. d)	Visibility: Location	Visibility: Days not Meeting State Std. e)
1	Los Angeles	14*	9.8*	2*	0*	2*	0*	.25	34	76	.28	.0553	3.3	1	.03	.014	.0022	0	0	Burbank Airport	214
2	W. Los Angeles	12	8.0	0	0	0	0	.25	15	65	.22	.0315	0	0	.02	.012	.0024	0	0		
3	Hawthorne	23	16.4	25	0	28	2	.19	3	11	.24	.0374	0	0	.09	.019	.0047	0	0	Los Angeles	
4	Long Beach	13	10.1	2	0	2	0	.16	3	10	.27	.0428	0	1	.11	.022	.0046	0	0	International	150
5	Whittier	13	8.8	0	0	0	0	.26	37	70	.29	.0444	0	1	.04	.016	.0036	0	0		
6	Reseda	17	12.5	11	0	15	0	.23	54	120	.18	.0390	0	0	.02	.011	.0018	0	0	Long Beach	
7	Burbank	20	13.9	18	0	21	0	.20	40	97	.25	.0507	0	0	.03	.012	.0020	0	0	Airport	210
8	Pasadena	14	8.4	0	0	0	0	.27	80	140	.34	.0531	0	2	.02	.010	.0022	0	0		
9	Azusa	7	5.8	0	0	0	0	.33	112	164	.27	.0511	0	2	.02	.010	.0017	0	0	William J. Fox	
9	Glendora	NM	NM	NM	NM	NM	NM	.34	121	171	.22	.0389	0	0	NM	NM	NM	NM	NM	Airport	2
10	Pomona	12	7.4	0	0	0	0	.25	61	117	.26	.0571	6.7	1	NM	NM	NM	NM	NM	(Lancaster)	
11	Pico Rivera	13	10.7	1	0	2	0	.26	61	108	.31	.0547	2.2	2	.04	.022	.0045	0	0		
12	Lynwood	31	21.8	55	0	61	16	.14	7	30	.34	.0459	0	2	.04	.016	.0042	0	0		
13	Santa Clarita	12*	5.4*	0*	0*	0*	0*	.25	71	122	.13*	.0368*	0*	0*	.02*	.007*	.0009*	0*	0*		
14	Lancaster	13	7.1	0	0	0	0	.21	27	95	.08	.0186	0	0	NM	NM	NM	NM	NM		
16	La Habra	24	10.7	6	0	7	7	.26	36	76	.23	.0428	0	0	.03	.011	.0021	0	0		
17	Anaheim	19	12.1	5	0	5	0	.24	13	42	.28	.0472	0	1	.03	.014	.0031	0	0		
17	Los Alamitos	NM	NM	NM	NM	NM	NM	.16	11	35	NM	NM	NM	NM	.07	.014	.0027	0	0		
18	Costa Mesa f)	16*	12.7*	5*	0*	8*	0*	.11*	0*	2*	.22*	.0463*	0*	0*	.03*	.006*	.0015*	0*	0*		
19	El Toro	9	5.1	0	0	0	0	.23	7	30	NM	NM	NM	NM	NM	NM	NM	NM	NM		
22	Norco	NM	NM	NM	NM	NM	NM	.23	56	114	NM	NM	NM	NM	NM	NM	NM	NM	NM	March Field	
23	Rubidoux	12	10.3	1	0	1	0	.27	113	172	.16	.0364	0	0	.02	.008	.0007	0	0	(Riverside)	205
23	Riverside	14	8.5	0	0	0	0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM		
24	Perris	NM	NM	NM	NM	NM	NM	.21	78	147	.14	.0322	0	0	NM	NM	NM	NM	NM		
25	Lake Elsinore	NM	NM	NM	NM	NM	NM	.24	62	121	NM	NM	NM	NM	NM	NM	NM	NM	NM		
28	Hemet	NM	NM	NM	NM	NM	NM	.19	21	77	NM	NM	NM	NM	NM	NM	NM	NM	NM		
29	Banning	NM	NM	NM	NM	NM	NM	.23	60	112	NM	NM	NM	NM	NM	NM	NM	NM	NM		
30	Palm Springs	6	2.9	0	0	0	0	.19	37	108	.09	.0239	0	0	NM	NM	NM	NM	NM		
30	Indio	NM	NM	NM	NM	NM	NM	.16	16	76	NM	NM	NM	NM	NM	NM	NM	NM	NM		
32	Upland	8	5.4	0	0	0	0	.32	97	146	.20	.0448	0	0	.03	.008	.0014	0	0	Norton AFB	
33	Ontario	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	(San Bernardino)	203
34	Fontana	7	5.8	0	0	0	0	.32	113	155	.18	.0363	0	0	.03	.006	.0005	0	0		
34	San Bernardino	11	8.1	0	0	0	0	.30	115	159	.18	.0409	0	0	.03	.006	.0006	0	0	Ontario	265
35	Redlands	NM	NM	NM	NM	NM	NM	.27	116	164	NM	NM	NM	NM	NM	NM	NM	NM	NM	Airport	
37	Crestline	NM	NM	NM	NM	NM	NM	.27	127	172	NM	NM	NM	NM	NM	NM	NM	NM	NM		

Figure III-1A

PPM - Parts by volume per million parts of air.
AAM - Annual Arithmetic Mean.
NM - Pollutant not monitored.
* - Less than 12 full months of data. May not be representative.
a) - The federal standard is annual arithmetic mean NO_2 greater than 0.0534 ppm.
b) - The federal standard is annual arithmetic mean SO_2 greater than 80 ug/m^3 (.03 ppm). No location exceeded the standard in 1989.
c) - The other federal (3-hour average > 0.50 PPM; 0.03 PPM, AAM) and state (1-hour > 0.25 PPM) standards were also not exceeded.
d) - Twenty-four hour average SO_2 ≥ 0.05 PPM with 1-hour Ozone ≥ 0.10 PPM, or with 24-hour TSP ≥ 100 ug/m^3.
e) - Visibility standard is less than 10 miles [illegible]

SOUTH COAST
AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive
El Monte, CA 91731

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Source/ Receptor Area No.	Location of Air Monitoring Station	Suspended Particulates PM10[g]						Particulates TSP[h]			Lead[h]				Sulfate[h]	
				No. (%) Samples Exceeding Standard		Annual Averages [i]							Quarters/Months Exceeding Standard			No. (%) Samples Exceeding Standard
		Number of Samples	Max. Conc. in ug/m^3 24-hour	Federal >150 ug/m^3 24-Hour	State >50 ug/m^3 24-Hour	AAM Conc. ug/m^3	AGM Conc. ug/m^3	Number of Samples	Max. Conc. in ug/m^3 24-Hour	AGM Conc. ug/m^3	Max. Mo. Conc. ug/m^3	Max. Qtrly. Conc. ug/m^3	Federal >1.5 ug/m^3 Qrtly Avg.	State $\geq$1.5 ug/m^3 Mo. Avg.	Max. Conc. in ug/m^3 24-Hour	State $\geq$25 ug/m^3 24-Hour
1	Los Angeles	58	137	0	33 (56.9)	61.1	56.0	61	217	107.4	0.17	0.12	0	0	23.0	0
2	W. Los Angeles	NM	NM	NM	NM	NM	NM	54	126	61.5	NM	NM	NM	NM	19.6	0
3	Hawthorne	55	133	0	24 (43.6)	49.7	44.9	60	370	80.3	0.13	0.07	0	0	22.6	0
4	Long Beach	59	119	0	26 (44.1)	50.5	46.5	61	195	82.3	0.11	0.08	0	0	20.0	0
5	Whittier	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
6	Reseda	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
7	Burbank	58	133	0	40 (68.9)	64.7	59.6	56	183	92.1	0.20	0.10	0	0	22.1	0
8	Pasadena	NM	NM	NM	NM	NM	NM	57	190	80.8	NM	NM	NM	NM	18.0	0
9	Azusa	59	172	1 (1.7)	35 (59.3)	60.7	54.1	57	341	110.9	NM	NM	NM	NM	16.9	0
9	Glendora	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
10	Pomona	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
11	Pico Rivera	NM	NM	NM	NM	NM	NM	57	206	95.4	0.19	0.12	0	0	32.0	1 ([illegible]8)
12	Lynwood	NM	NM	NM	NM	NM	NM	56	239	105.9	0.15	0.11	0	0	19.6	0
13	Santa Clarita	48	100	0	23 (47.9)	53.5	48.8	NM	NM	NM	NM	NM	NM	NM	NM	NM
14	Lancaster	56	110	0	25 (44.6)	47.0	43.0	60	154	72.6	NM	NM	NM	NM	17.0	0
16	La Habra	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
17	Anaheim	NM	NM	NM	NM	NM	NM	61	264	87.4	0.15	0.08	0	0	17.7	0
17	Los Alamitos	55	138	0	21 (38.2)	46.2	42.0	61	251	90.1	NM	NM	NM	NM	17.4	0
18	Costa Mesa	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
19	El Toro	60	88	0	20 (33.3)	41.7	38.1	61	208	89.1	NM	NM	NM	NM	16.5	0
22	Norco	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
23	Rubidoux	61	252	7 (11.5)	51 (83.6)	94.3	81.3	61	347	132.2	0.07	0.05	0	0	16.9	0
23	Riverside	NM	NM	NM	NM	NM	NM	59	277	114.7	0.07	0.06	0	0	16.6	0
24	Perris	59	187	1 (1.7)	39 (66.1)	61.4	52.2	58	303	98.4	NM	NM	NM	NM	15.9	0
25	Lake Elsinore	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
28	Hemet	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
29	Banning	60	194	2 (3.3)	20 (33.3)	47.2	37.1	60	464	75.1	NM	NM	NM	NM	13.8	0
30	Palm Springs	60	292	2 (3.3)	17 (28.3)	44.6	35.8	61	768	69.6	NM	NM	NM	NM	12.1	0
30	Indio	58	712	4 (6.9)	39 (67.2)	90.3	66.4	60	1465	136.5	NM	NM	NM	NM	18.3	0
32	Upland	NM	NM	NM	NM	NM	NM	58	292	98.7	0.11	0.08	0	0	13.9	0
33	Ontario	61	254	4 (6.6)	49 (80.3)	79.0	69.7	57	349	116.2	NM	NM	NM	NM	16.4	0
34	Fontana	61	227	2 (3.3)	47 (77.0)	77.1	68.5	61	333	128.6	NM	NM	NM	NM	14.9	0
34	San Bernardino	59	271	3 (5.1)	44 (74.6)	80.5	69.2	60	327	119.4	0.09	0.07	0	0	17.8	0
35	Redlands	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
37	Crestline	59	87	0	13 (22.0)	39.1	34.9	61	160	58.2	NM	NM	NM	NM	10.2	0

ug/m^3 - Micrograms per cubic meter of air.
AGM - Annual Geometric Mean.
g) - PM10 suspended particulates samples were collected every 6 days using the size-selective inlet high volume sampler with quartz filter media (PM10 refers to fine particles with aerodynamic diameter of 10 micrometers or less).
h) - Total suspended particulates, lead, and sulfate were determined from samples collected every 6 days by the high volume sampler method, on glass fiber filter media. Federal TSP standard superceded by PM10 standard, July 1, 1987.
i) - Federal PM10 standard is AAM > 50 ug/m^3; state standard is AGM > 30 ug/m^3.

Figure III-1B

LOS ANGLES, CA CIVIC CENTER PACIFIC 34° 03' N 118° 14' W 270 FT. 1976

Month	Temperatures °F: Normal: Daily maximum	Daily minimum	Monthly	Extremes: Record highest	Year	Record lowest	Year	Normal Degree days Base 65 °F: Heating	Cooling	Precipitation in inches: Water equivalent: Normal	Maximum monthly	Year	Minimum monthly	Year	Maximum in 24 hrs.	Year	Snow, Ice pellets: Maximum monthly	Year	Maximum in 24 hrs.	Year
(a)				36		36					36		36		36		36		36	
J	66.3	46.8	56.7	95	1971	28	1949	268	10	3.00	14.94	1969	0.00	1976	6.11	1956	0.3	1949	0.3	1949
F	67.6	48.5	58.1	91	1971	34	1949	207	16	2.77	12.42	1941	T	1964	4.02	1944	T	1951	T	1951
M	68.6	49.8	59.2	96	1972	35	1976	190	10	2.19	8.14	1943	0.00	1959	3.41	1943	0.0		0.0	
A	70.5	52.9	61.7	99	1966	39	1975	124	25	1.27	6.02	1965	0.00	1973	2.05	1956	0.0		0.0	
M	73.2	56.1	64.7	102	1967	46	1964	68	51	0.13	1.41	1955	0.00	1970	1.07	1955	0.0		0.0	
J	76.5	59.5	68.0	106	1973	50	1953	25	115	0.03	0.32	1964	0.00	1975	0.32	1964	0.0		0.0	
J	82.9	63.5	73.2	103	1959	54	1952	0	238	0.00	0.03	1968	0.00	1976	0.01	1969	0.0		0.0	
A	83.7	64.4	74.1	103	1967	53	1943	0	262	0.04	0.39	1958	0.00	1975	0.30	1958	0.0		0.0	
S	82.5	62.8	72.7	110	1955	51	1948	5	236	0.17	2.82	1978	0.00	1975	1.83	1976	0.0		0.0	
O	78.0	58.7	68.4	104	1958	41	1971	35	140	0.27	1.53	1941	0.00	1970	0.42	1941	0.0		0.0	
N	73.2	52.1	62.7	100	1966	37	1976	113	44	2.02	9.68	1965	0.00	1975	4.07	1970	0.0		0.0	
D	68.0	48.1	58.1	89	1956	32	1951	218	0	2.16	6.57	1971	T	1963	3.92	1965	T	1947	T	1947
YR	74.3	55.3	64.8	110	SEP 1955	28	JAN 1949	1245	1185	14.05	14.94	JAN 1969	0.00	JUL 1976	6.11	JAN 1956	0.3	JAN 1949	0.3	JAN 1949

Month	Relative $ humidity pct.: Hour 04	Hour 10	Hour 16	Hour 22 (Local time)	Wind: Mean speed m.p.h.	Prevailing direction	Fastest mile: Speed m.p.h.	Direction	Year	Pct. of possible sunshine	Mean sky cover, tenths, sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Ice pellets 1.0 inch or more	Thunderstorms %	Heavy fog, visibility 1/4 mile or less %	Temperatures °F: Max.: 90° and above (b)	32° and below	Min.: 32° and below	0° and below	Average station pressure mb (Elev. feet m.s.l.)
(a)	17	10	23	11	24	23	35	35		32	34	34	34	34	36	16	23	23	36	36	36	36	
J	63	51	50	67	6.8	NE	49	N	1946	69	4.4	16	8	9	5	0	1	2	*	0	*	0	
F	71	54	52	70	6.9	W	40	NW	1961	72	4.7	12	7	9	5	0	1	2	*	0	0	0	
M	74	52	52	72	7.0	W	47	NW	1964	73	4.7	13	9	9	6	0	1	1	*	0	0	0	
A	78	53	54	74	6.6	W	40	NW	1955	70	4.7	12	10	8	4	0	1	1	1	0	0	0	
M	81	56	55	75	6.3	W	39	NW	1945	66	4.9	11	12	8	1	0	*	1	1	0	0	0	
J	83	59	56	78	5.7	W	32	N	1949	65	4.3	14	10	6	1	0	*	1	1	0	0	0	
J	84	54	53	79	5.4	W	21	W	1947	82	2.7	21	9	1	*	0	*	1	4	0	0	0	
A	84	56	55	79	5.3	W	24	E	1945	83	2.6	22	8	1	1	0	*	1	4	0	0	0	
S	78	52	54	76	5.3	W	27	NW	1941	79	3.0	18	9	3	1	0	*	1	5	0	0	0	
O	76	55	56	74	5.7	W	48	N	1959	73	3.0	16	9	6	2	0	*	3	3	0	0	0	
N	61	45	49	62	6.4	W	42	N	1946	74	3.7	17	7	6	3	0	1	2	1	0	0	0	
D	62	45	50	62	6.6	NE	44	SE	1943	71	4.2	15	9	8	5	0	1	2	0	0	*	0	
YR	75	53	53	72	6.2	W	49	N	JAN 1946	73	4.0	185	106	74	34	0	6	17	20	0	*	0	

Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows: Maximum monthly precipitation 15.80 in December 1889; maximum precipitation in 24 hours 7.36 in December 1933; maximum monthly snowfall 2.0 in January 1932; maximum snowfall in 24 hours 2.0 in January 1932.

(a) Length of record, years, through the current year unless otherwise noted, based on January data.
(b) 70° and above at Alaskan stations.
* Less than one half.
T Trace.

NORMALS - Based on record for the 1941-1970 period.
DATE OF AN EXTREME - The most recent in cases of multiple occurrence.
PREVAILING WIND DIRECTION - Record through 1963.
WIND DIRECTION - Numerals indicate tens of degrees clockwise from true north. 00 indicates calm.
FASTEST MILE WIND - Speed is fastest observed 1-minute value when the direction is in tens of degrees.

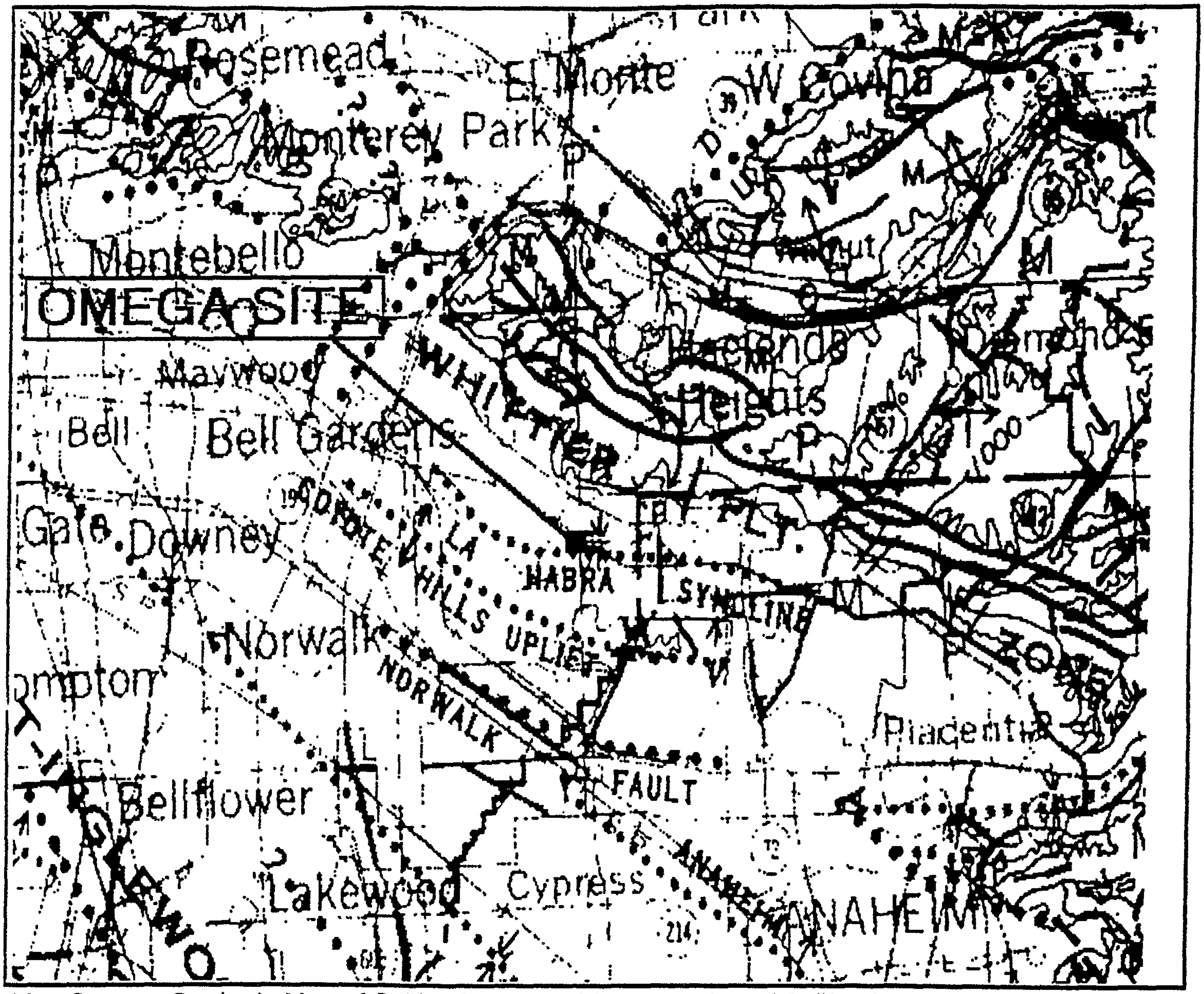
$ Through 1963.

% Through 1964. The station did not operate 24 hours daily. Fog and thunderstorm data may be incomplete.

Figure III-C Climatological Summary

OMEGA RECOVERY SERVICES OPERATION PLAN PART B

FIGURE III-2



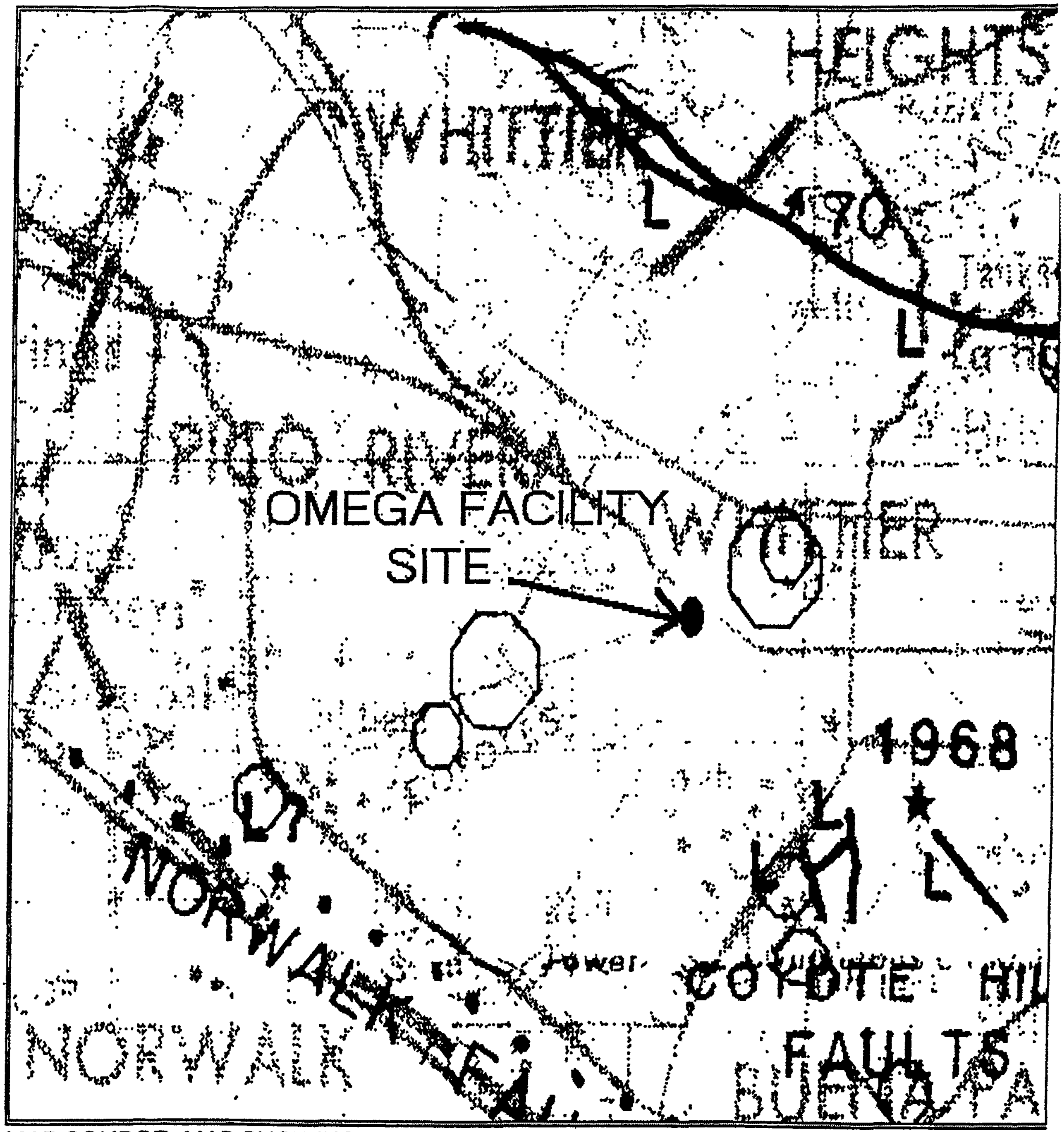
Map Source: Geologic Map of California, Dept of Conservation of California , 1977

Omega Whittier facility and its proximity to the Whittier Fault Line

<10 miles >

I

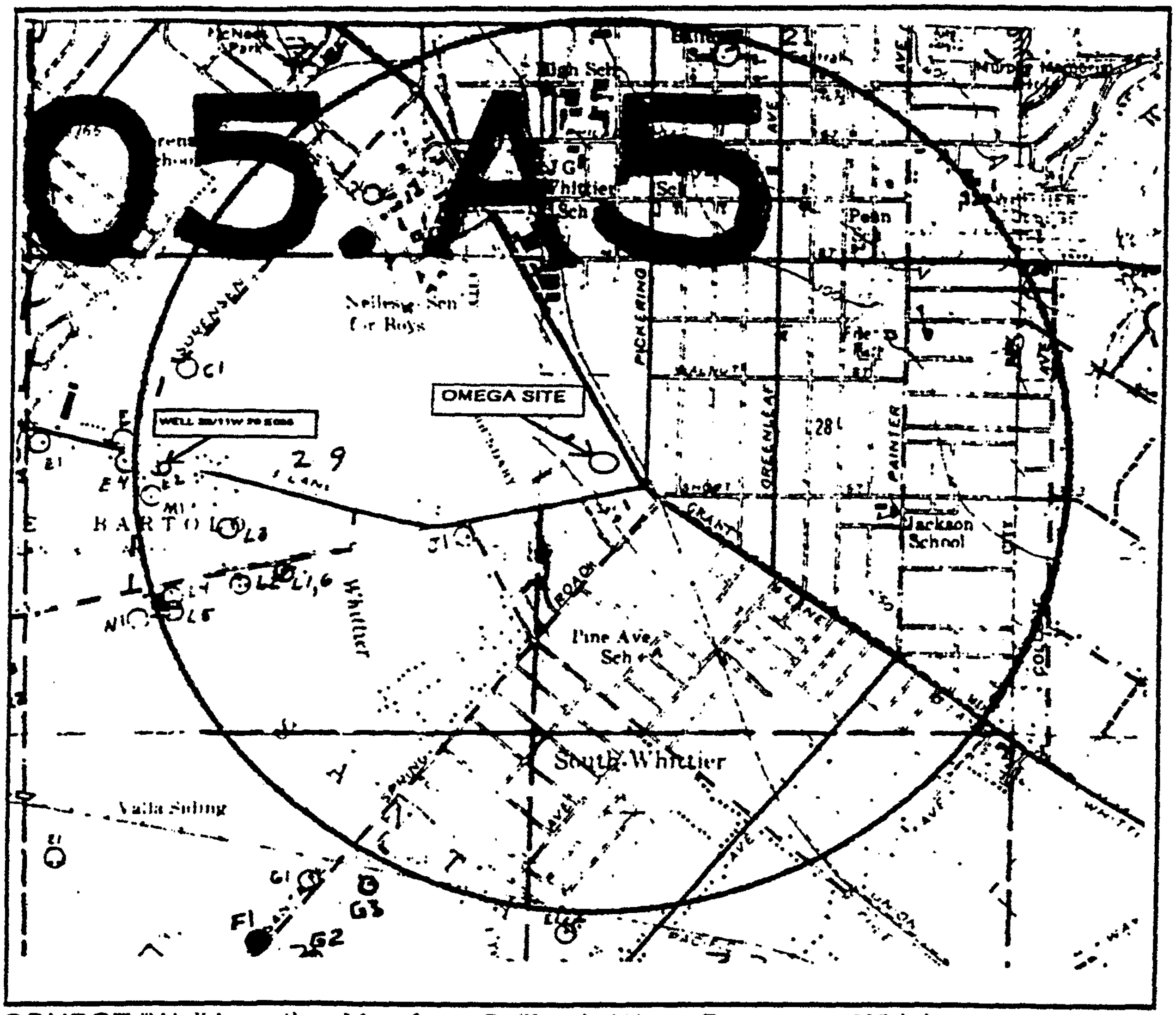
FIGURE III-3



MAP SOURCE: MAP SHOWING LATE QUATERNARY FAULTS AND 1978-84 SEISMICITY OF THE LOS ANGLES REGION, CALIFORNIA" Interior U.S> Geological Survey, 1987

SCALE <---------------2 MILES----------- >

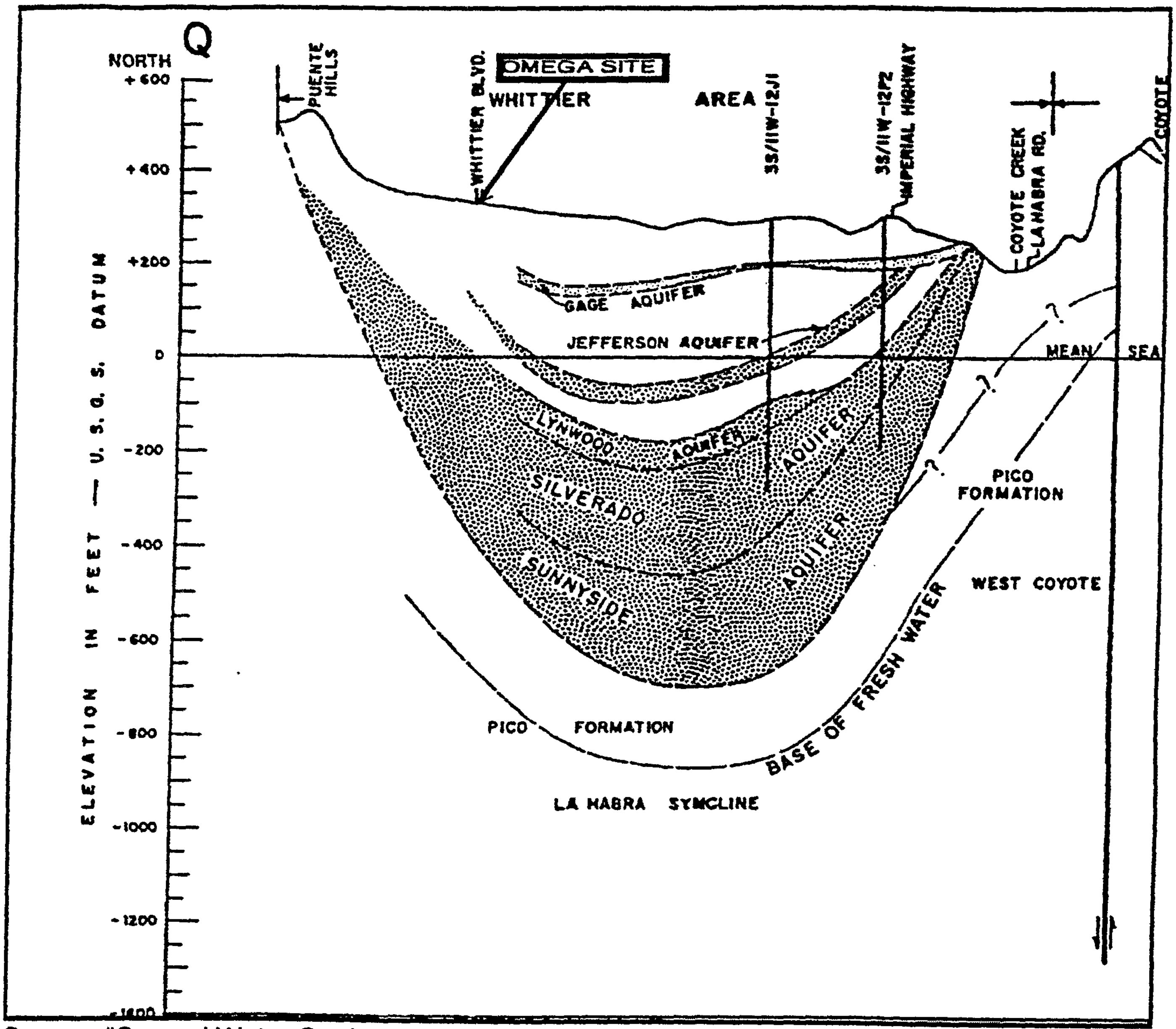
FIGURE III-4
WELL LOCATION MAP FOR THE WHITTIER SITE WITHIN ONE MILE RADIUS



SOURCE:"Well Location Map from California Water Resources Whittier ·Quadrangle"

This displays the wells located within one mile radius of the Omega Facility. The Well number 2S/11W 29 05E is marked. This is the only well with water data generated within 10 years.

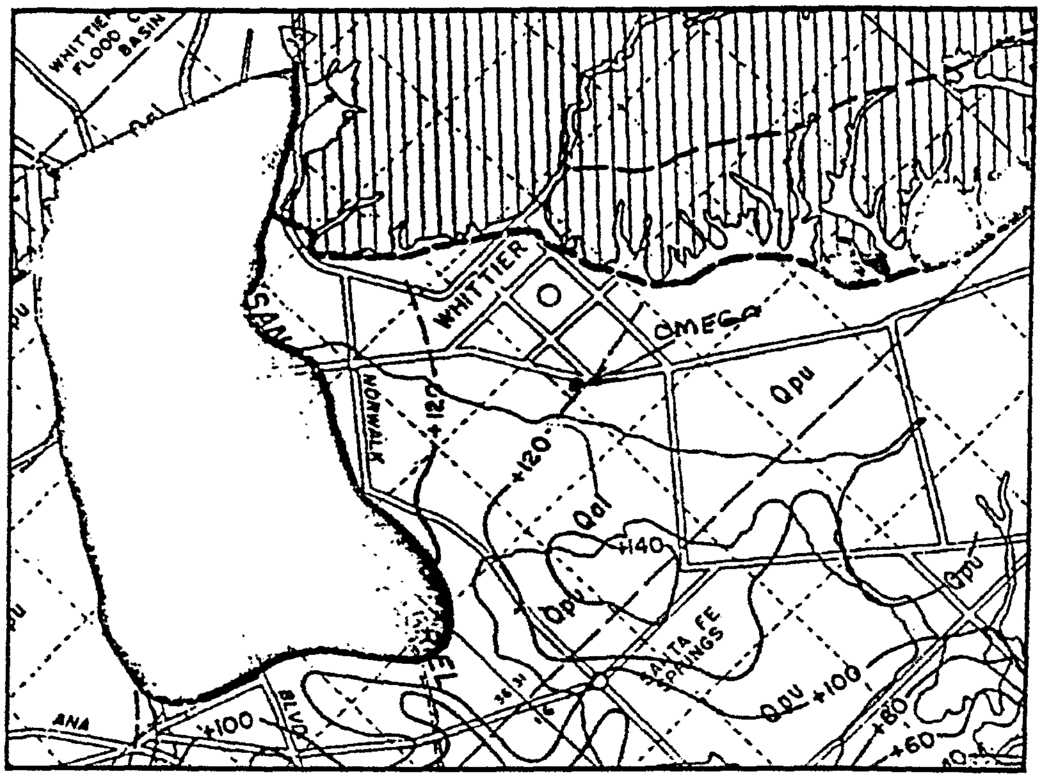
FIGURE III-5
GROUND WATER GEOLOGY UNDER THE WHITTIER SITE



Source: "Ground Water Geology of the Coastal Plain of the Los Angeles County"

This displays the depth to the various ground water aquifiers near Omega's Whittier facility.

FIGURE III-6
LOCATION OF AQUIFIERS TO THE OMEGA WHITTIER FACILITY



Source: "Ground Water Geology of the Coastal Plain of the Los Angeles County"

This shows the location of the closest aquifier to Omega's Whittier facility. They are the aquifiers in the Lakewood Formation. This shows that the groundwater under the site is not directly connected hydraulicly to a aquifier used for drinking water.

FIGURE III -7
Ground Water Contours Map

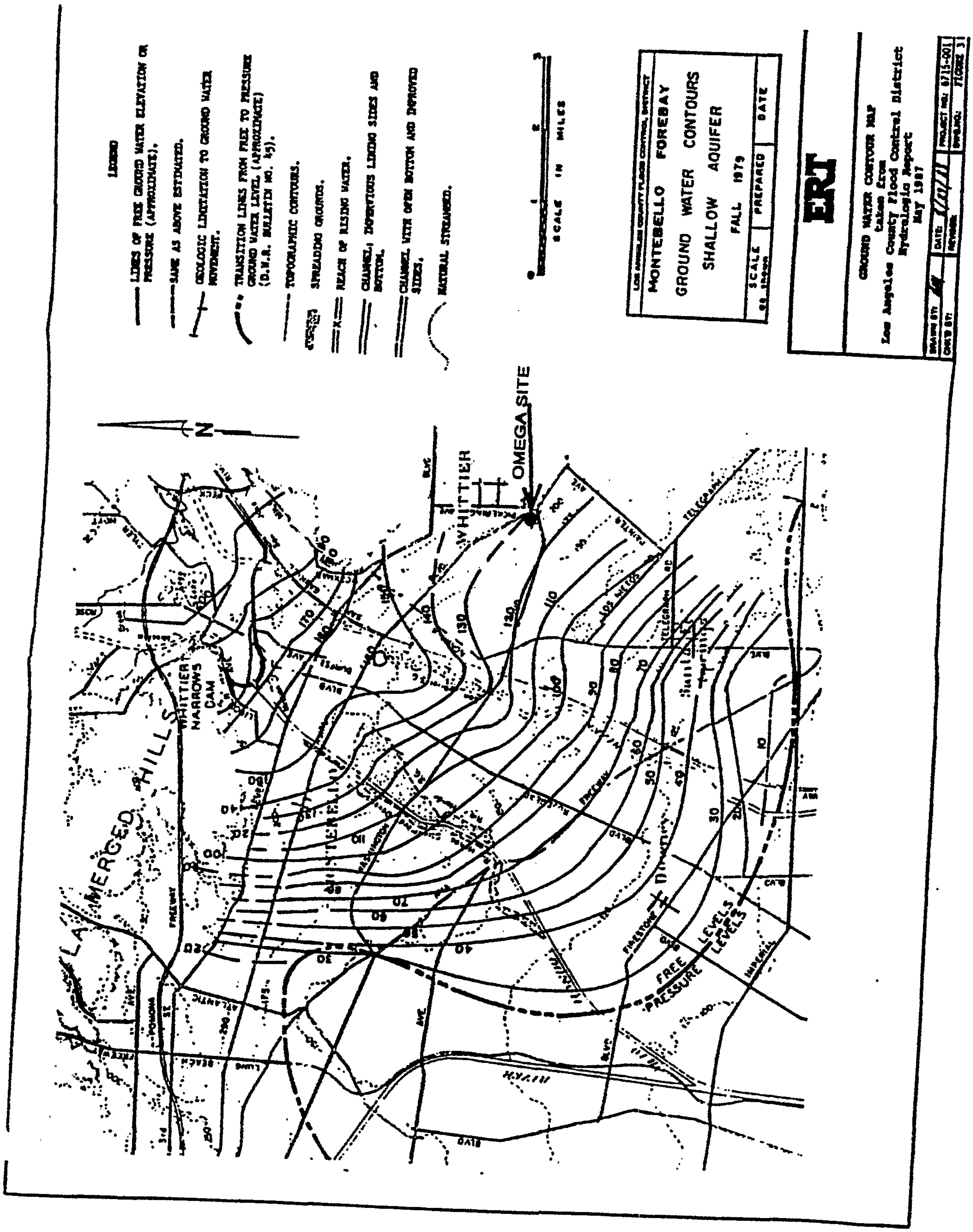
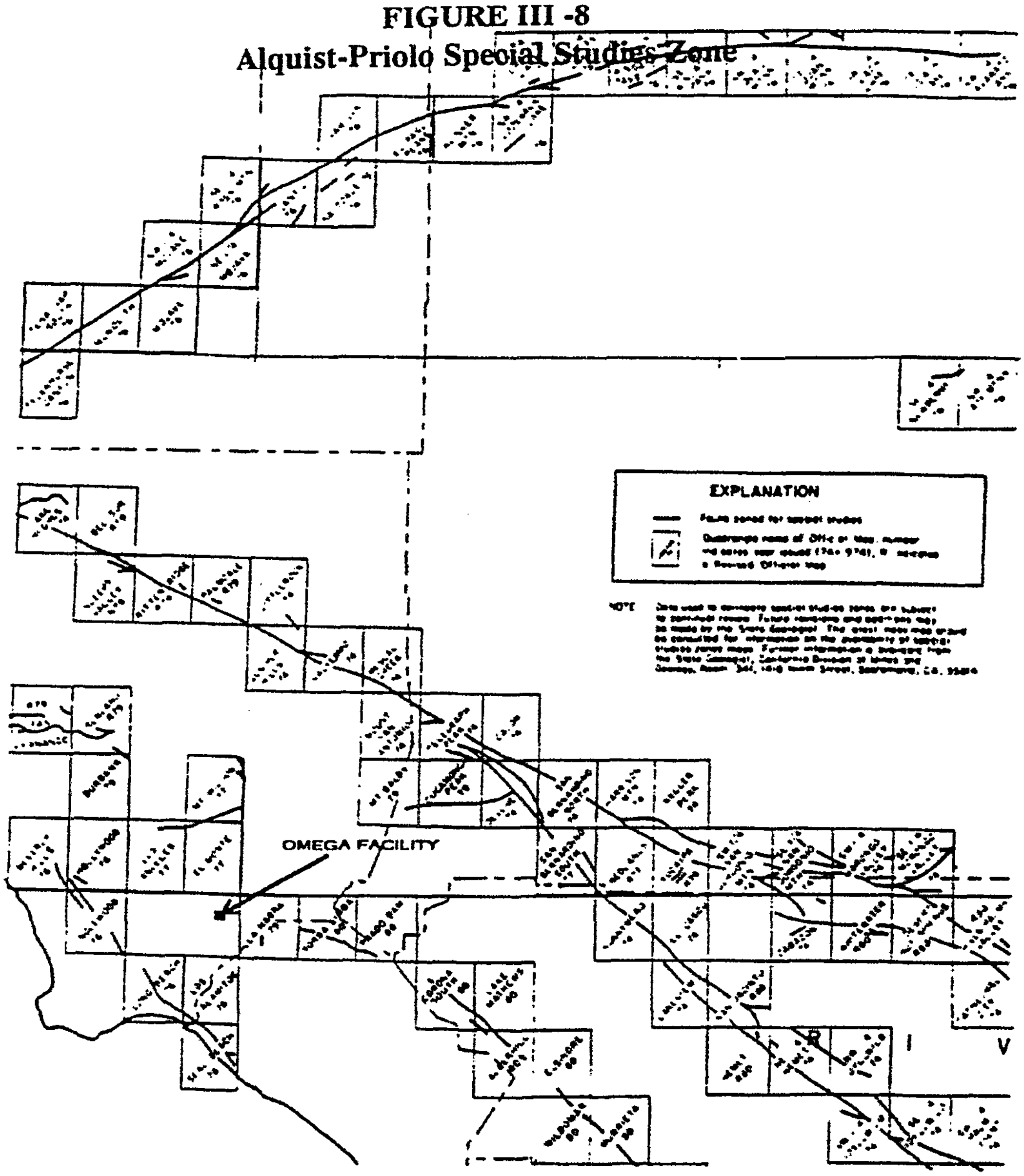


FIGURE III -8
Alquist-Priolo Special Studies Zone



Map Source: Department of Conservation Division of Mines and Geology 1985

N

SCALE IN MILES
0 20 40 60

FAULT-RUPTURE HAZARD ZONES IN CALIFORNIA

V. CHARACTERISTICS OF HAZARDOUS WASTES HANDLED AT THE FACILITY.

A. Waste Identification Of Hazardous Wastes Handled At Facility.

The waste presently accepted at the OMEGA facility can be characterized broadly as organic solvents and chemicals;and aqueous wastes with organic waste constituents. The primary business of the facility is, and will continue to be, the recycling of industrial and commerical hazardous and nonhazardous wastes to recover useful products. The complete list of hazardous wastes that OMEGA intends to accept under the terms and conditions of its Part B Permit is included in Appendix B and Appendix L which is the Part A submitted to DHS and EPA . Wastes may be received at the site manifested under a single waste designation, or may have any combination of the designations included in Appendix B. The listing of these wastes does not connote that they are coming or will be coming to the site. Only that the facility has the capability to handle these wastes at the approximate quantities listed.

Because State and Federal waste types often do not correspond, separate, overlapping lists for EPA and DHS waste code designations are provided in Appendix B. Also, the basis for hazard designation and hazardous properties are provided for each waste for which this information is available.

Wastes presently are received at the facility in containers and bulk shipments and are unloaded either at the Drum Storage Unit or into facility storage/ treatment tanks to await further processing.These wastes must have prior approval before being accepted at Omega's facility. Prior approval requires the generator submit a signed Waste Profile Form (see Figure V-1) and when required an appropriate sample of incoming waste. The accepted wastes when they arrive at the facility must undergo pre acceptance and incoming load sampling and analysis in accordance with Omega's Waste Analysis Plan (see Appendix C). The various types of waste treament equipment and procedures that are currently used or planned to handle, store, and process these accepted hazardous wastes are described in Section VI "Major Waste Management Devices used at the Facility".

These wastes arrive at the Omega site in containers and bulk truckloads. After manifest checking and load sampling, analysis, and approval according to the procedures in the Omega's Waste Analysis Plan (see Appendix C), these wastes are unloaded into the appropriate Container Storage Area or into an an appropriate storage tank. All bulk materials that arrive at facility are pumped from the authorized tankers and vacuum trucks to an appropriately designed holding tank. This transfer is done through compatible pumps and hoses.These wastes are then scheduled for treatment in the proper Waste Treatment Unit or transfer to other off-site facilites for further treatement or disposal.The types of waste management and processing equipment that are or will be used to handle, store, and treat the various hazardous wastes are described in Section VI Major Waste Management Devices.

. The processes that produce these wastes are from a wide assortment of manufacturing and industrial processes. These commercial practices generate the wastes listed above.

Sources of these wastes are from the following industries.
Food and Kindred Products
Textile Mill Products
Lumber and Wood Products
Furniture and Fixture Products
Paper and Allied Products
Printing and Publishing
Chemicals
Petroleum Refining
Rubber and Plastics

Leather
Primary Metal
Fabricated Metal
Transportation Equipment
Machinery
Electrical and Electronic
Medical and Optical

ACUTE AND EXTREMELY HAZARDOUS WASTE

Acute and Extremely hazardous or designated as containing toxic contaminants that qualify the waste as an Extremely Hazardous Waste will not be processed at the facility. Omega will only act as a transfer agent for generators to another off-site facility capable and permitted to handle these types of wastes. Prior to accepting and transferring this waste to an appropriately permitted facility, Omega will work with the generator to obtain an Extremely Hazardous Waste Permit as required in California Regulations Title 26-66570. The ultimate off site facility will be designated as the treatment site. Omega will only be a transfer site.

NON ACCEPTABLE WASTES

Wastes that specifically are not accepted at the site include radioactive materials, infectious materials, explosives, municipal garbage/refuse, polychlorinated biphenyls (PCBS) regulated under the Toxic Substances Control Act (TSCA), and dioxin-containing wastes (i.e, EPA Nos. F020, F021, F022, F023, F026, F027, and F028).

ACCEPTABLE WASTES AND TYPICAL TREATMENT METHODS

A. The highest priority is to recycle all wastes back to the original generator's commercial use specifications and/or other end user requirements by removing through various treatment processes the contaminants in the waste stream from the original desired product.
A large amount of the following codes will fall under this category.
Federal Hazardous Waste Codes:

D001,D002, F001, F002, F003, F005, K009 to K030, K094, K095, K096, K083, K085, K103, K104, K105, K048, K049, K050, K051, K052, K062, K086, K084, K101, K102, and all the U Series .

California Hazardous Waste Codes:
211, 212, 213, 214, 311, 331, 341, 343, 451, 461, and 541.

B. If the waste material has little economic value for recycling or has a complex range of contaminants making the recycling process uneconomic, then waste will be processed to either reduce its hazardous characteristics by removing a waste component quantity that would eliminate one or more hazard category. The resultant waste material could then be handled or treated by a method to eliminate any long term hazardous condition.

An example would be the distillation of trace organics from waste water. The resultant waste water could then be treated and distilled to high purity for use in industrial uses such as boiler or cooling tower water make up. Another method would be the precipitation of trace metals from either organic or inorganic liquids. The resultant organic liquid could then be used for a fuel use.

The following codes would primarily fall under this type of treatment process:

Federal Waste Codes:

D004, D005, D006, D007, D008, D009, D010, D011, F006, F008, F010, F012, F019, K002 to K008.

California Waste Codes:

133, and 134.

C. The next type of methods used would be the neutralization and reaction of various waste streams. This method eliminates the hazard category or reduces the category to a much lower level.

An example would be the adjustment of acid and alkaline solutions to a pH of 7 where the acidic and alkali component is changed into an inorganic salt which can be physically removed from the solution. Another method of this type would the reaction of reactive wastes under controlled conditions to change the structure of the hazardous molecule to a less hazardous condition.

Federal Waste Codes:

F008, F010, F011, F020, and F021.

California Waste Codes:

123, 181, 352, 561, 751, and 113.

D. A fourth method is use the inherent thermal value of the organic waste material and process it into an acceptable fuel for use in industrial boilers and furnaces at sites which are permitted by the appropriate state and federal agencies.

Federal Waste Codes:

D001, D002,K048, K049, K050, K051, K052, and K086.

California Waste Codes:

221, 241, 251, 252, 352, 461, and 491.

This method would only use the above types of waste for fuel. These wastes are listed because they are ignitable, corrosive, or reactive - unless produces toxic gas upon reaction. None of the fuels to be used in this process will contain any constituents that are contained in Code Federal Regulations 40 Appendix VIII list.

E. A fifth method is to destroy the organic component through a thermal destruction process such as incineration. This method would require Omega to process and blend the waste into an acceptable form and type for the various off-site incineration facilities.

Federal Waste Codes:

D001, D002, D003, D012, D013, D014, D015, D016, D017, F020, F021, F022, F027, K001, K031 to K043, K097, K098, K084, K101, K102, P001 to P122, and all the U Series.

California Waste Codes:

241, 251, 252, 272, 311, 331, 341, 343, 351, 352, 451, 461, 491, 541, 561, 741, and 751.

F. A sixth method is to prepare the waste for disposal at an off-site land repository facility. These wastes would include the following:

Federal Waste Codes:

F028

California Waste Codes:

181, 512, and 513

G. A seventh method is the biological treatment of waste. This method would use a variety of anaerobic and aerobic micro organisms to reduce the organic wastes to their natural or basic elements such as water and carbon dioxide.

A.1 Recyclable Wastes

The OMEGA facility is capable of managing a wide variety of organic wastes through either recycling or use as a supplemental fuel. Most of these wastes arrive at the site manifested under a few common EPA waste codes, such as D001 (ignitable waste) or F001-FOO5 (halogenated and non-halogenated solvents). However, generators are obligated to include waste numbers for minor constituents, waste contaminants, or wastes which may no longer be present (i.e., "derived-from" wastes). For example, metal contaminant designations (e.g., D005-D008) and uncommon EPA-listed "P" and "U " wastes may be used to identify incoming wastes acceptable for on-site treatment. Because the potential waste code variations for wastes that may be accepted at the facility are impossible to predict, the list of acceptable waste designations in Appendix B is all inclusive. In actuality, some of the waste codes may never be received.

Solvent wastes accepted at the facility are generated from activities such as metal cleaning and degreasing, machining, and paint/coating manufacture and use. Industrial categories that best describe these activities include:

Examples of representative types of waste solvents that can be expected to be received at the facility are as follows:

PAINT INDUSTRY (Primarily oxygenated solvents and hydrocarbon solvents with paint related solids)

Waste solvent composition (by volume):	Toluene	40%
	Acetone	20%
	Methyl ethyl ketone	20%
	Isopropyl alcohol	15%
	Dirt, organic pigments	5%

Specific gravity (H_20 = 1.00 60^oF): 0.85-0.95; pH: 7; Flash point: 28 ^oF

ELECTRONICS INDUSTRY (can be chlorinated or fluorinated solvents such as 1,1,1-trichloroethane, 1,1,2-trichloro 1,2,2-trifluoroethane)

Waste solvent composition (by volume):	Pure component	90%
	Nonhazardous resin	10%

Specific gravity (H_20 = 1.00 60 ^{O}F): 1.3 - 1.5; pH: 2 - 10; Flash point: None

METAL CLEANING Industry (solutions of chlorinated hydrocarbons)

Waste solvent composition (by volume):	Perchlorethylene	85%
	Dirt, soil	15%
	or	
	Methylene chloride	80%
	Dirt, soil	20%

Specific gravity (H_20 = 1.00 60 ^{O}F): 1.1 - 1.45; pH: 3 - 9; Flash point: None

PRINTING INDUSTRY

Waste solvent composition (by volume):	Perchloroethylene	75%
	N-Butyl Alcohol	15%
	Ink Resin	10%

Specific gravity (H_20 = 1.00 60 ^{O}F): 1.1 - 1.45; pH: 5 -8; Flash point: None

REFRIGERATION AND AIR CONDITIONING INDUSTRY

Waste solvent composition (by volume):	Trichlorofluoromethane	80%
	Oil	15%
	Water	5%

Specific gravity (H_20 = 1.00 60 ^{O}F): 1.1 - 1.45; pH: 2 -8; Flash point: None

Other representative types of organic solvents that are received from an assortment of industries include butyl cellosolve, methanol, xylene, butyl acetate, ethylene dichloride, mineral spirits, and heptane.

OTHER WASTE PROCESSING CAPABILITIES AT THE EXISTING AND PROPOSED FACILITIES

1. Wiped Film Distillation, Batch Distillation, Reactor Systems and Treatment Units

2. Evaporation

   Waste water that is contaminated with only non-volatile hazardous waste material which can be reduced to a smaller and more manageable volume by evaporation. This method removes the water from the waste and leaves behind a slurry of non-volatile residues.

   This residue can then be further processed by through incineration and/or disposal in landfills. This reduces the total amount of material that must be disposed of in a proper manner. This evaporation method is located in the processing and recycling area shown in Figure II-5,II-6.

3. Consolidation

Some unrecycleable waste materials are generated, especially by small generators, in small, unmanageable and inappropriate amounts that can not be sent to an authorized landfill or incineration site with out addition handling and consolidation. These wastes may need to be either repackaged in appropriate containers, segregated into compatible groups and/or consolidation into workable amounts in order to assure the proper shipment to and handling by the landfill or incineration facilities. This method is performed in specific area of the diked storage area.

4. Solidification/Stabilization

Wastes that have no economic value for recycling and the wastes residuals from Omega's processing systems, are solidified, in drum containers, with a solidification materials similar to cement dust or diatomacious coagulant. This waste solidification will then render a solid like material that can be packaged in a DOT certified drum for disposal at a permitted landfill or incineration site.

The drums or material from tanks that need to be solidified are brought to the solidification area for processing. The personnel are all wearing appropriate protective gear. The drums are cut open using an air operated drum deheader. The waste material is removed from the container and mixed with compatible solidification material so that the resultant product is completely and effectively solidified. This material is repackaged in an appropriate container and placed back in a proper storage area.

Through this stabilization/solidification process the four primary goals of treating hazardous waste for ultimate disposal are attained:

(1) Improved the handling and physical characteristics of the waste.

(2) To decrease the surface area across which transfer or loss of contained pollutants can occur.

(3) To limit the solubility of any pollutants contained in the waste.

(4) To detoxify contained pollutants.

These stabilized wastes would then be packaged in appropriate containers and sent to an authorized landfill or incineration facility. This method is done in the identified area of the storage system.

5. Fuel Production

Some wastes because of their inherent energy value should be burned as fuel and therefore avoiding wasteful disposal in landfills. With the proper blending and adjustment through chemical and physical means some waste material can be made available to certain approved facilities for such burning. These facilities include cement kilns and similar operations. These facilities are licensed by state and federal agencies to accept wastes meeting the requirements of these agencies for burning. Waste oil and alcohols for example fall within this grouping.

6. Neutralization

Some wastes especially acids and alkalis can be neutralized through a combination of physical and chemical operations to form mineral salts and water. This waste water rendered non hazardous can often be disposed of through public sanitation system or the waste water which contains on inorganic non- volatile component can be evaporated to leave behind the inorganic salt that no longer qualifies as hazardous waste.

There are a variety neutralization methods that can use to transform a hazardous waste into a less or non-hazardous waste.

An example of proper neutralization technique is the following:

Through prior process compatibility determinations , a specific waste has been designated for the batch neutralization process. Personnel wearing proper protective garments and equipment will move the waste container(s) to the neutralization area (See VI Waste Management Devices- Waste Water Treatment Units and Methods).

The waste will have a treatment method described for the waste to be followed by the treating personnel. This treatment method will have been signed off as to being correct both by plant manager and laboratory manager or his designated subordinate.

The treating personnel will then place the waste in a process unit that is compatible with the waste. At the proscribed rate amounts of a dilute alkali solution will be added to the acid solution to adjust and raise the pH to a neutral level of 7.0. In the case of an alkali waste , dilute amounts of an acid solution will be added to lower the pH to 7.0.

When the process has been completed the product will be returned to the storage area in a proper container and the batch processing information will be logged onto its waste control sheet.

7. Reactions

There are four types of reactions of organic compounds can be classified:

Acid-Base: This method is previously described in the neutralization method.

Substitution: In this type of reaction two compounds form two new compounds. The cation of one reactant combines with anion of the other reactant.

An example-

$AB + CD \rightarrow AD + CB$

Two higher hazardous wastes such as AB and CD are reduced to non-hazardous or lower hazardous characteristic type products such as AD and CB.
Addition-elimination:

Oxidation and Reduction: The characteristic feature of an oxidation-reduction reaction is a transference of electrons from one substance to another. The substance that gives up its electrons is called a reducing agent. It contains the atoms which are oxidized, that is, have lost electrons. The substance that gains the electrons is called the oxidizing agent. It contains the atoms which are reduced, that is, have gained electrons.

These various reactions are to reduce or eliminate the hazardous potential of the various hazardous wastes .

This type of reaction is used in the formation of Carbon Dioxide in fire extinguishers.

Sodium bicarbonate and aluminum sulfate are stored as separate aqueous solutions or as powders within the extinguisher. When mixed together, they form carbon dioxide.

$$6NaHCO_3 + Al_2(SO_4)_3 \rightarrow 3Na_2SO_4 + 2Al(OH)_3 + 6CO_2$$

8. Thermal Treatment of Hazardous Wastes

This permit application covers only acceptance of hazardous waste that is consolidated and adjusted and then shipped to an authorized incineration facility other than Omega at Whittier.

Supplemental Fuels Blending - Organic-bearing wastes that cannot be recycled, but have a sufficient energy content and a suitable composition, are/will be accepted for blending into a supplemental fuels waste that can be burned at off-site permitted facilities.

Some wastes can be used as fuels in authorized boilers or furnaces or because of regulations and rules by EPA and DHS they are forbidden to be accepted at landfill facilities. These wastes will be adjusted to meet the requirements of these off-site incineration facilities. The waste will be accumulated in the storage area when the quantity is appropriate they will be manifested and shipped to permitted hazardous waste incineration facilities.

9. Biological Treatment Methods

Many wastes including waste waters contaminated with organic components can be reduced through anaerobic and aerobic micro organisms to their basic molecular levels such as organics reduced to carbon dioxide and water. Many complex compounds can biologically be reduced to their elemental nature making the resultant product non hazardous.

A.2 Facility-Generated Wastes

The overwhelming majority of facility-generated wastes are, and will continue to be, the byproducts of solvent recycling activities. These waste streams include dilute aqueous waste of low BTU value, still bottom residuals, and non-recyclable organic (primarily halogenated solvent) wastes. Presently, these wastes are manifested off-site for use as supplemental fuels or for destructive incineration; other options, including on-site treatment, may be used in the future. Other sources of facility-generated wastes include laboratory wastes that are accumulated in a 55-gallon drum and contaminated water or waste captured in secondary containment areas. The types and quantities of facility-generated wastes that were manifested off-site in 1989 are summarized on Table V-1. Additional types and composition of wastes are listed in Figure V-2 Hazardous Wastes Compositions

TABLE V-1
TYPICAL TYPES OF WASTES GENERATED BY OMEGA

Generator: Omega Recovery Services Date: September 15, 1989
Address: 12504 E. Whittier Blvd
Whittier, CA 90602

Contact/Phone EPA Waste Code(s): D001, F001,F002,F003, & F005

EPA ID No. CAD042245001

Source: Industrial Solvent Recycling

Qualification Analysis for Lebec.

Organics	
Acetone	1.9%
Isopropyl Alcohol	5.1%
Methylene Chloride	1.5%
Methyl Ethyl Ketone	3.5%
Tetrahydrofuran	0.3%
1,1,1 Trichloroethane	2.5%
Trichloroethylene	0.7%
Methyl Isobutyl Ketone	1.7%
Toluene	7.2%
Butyl Acetate	2.7%
Glycol Ether PM Acetate	0.6%
Ethyl Benzene	2.7%
Xylene	16.0%
Cyclohexanone	0.3%
C9-C10 Alkyl Benzenes	5.2%
Tributyl Phosphate	4.7%
C6-C16 Aliphatics	43.4%
Benzene	<0.1%

Heat Content	10,700	Btu's /lb
Viscosity	25	cp
Solids	9	% volume
Sulfur	0.2	% Wt.
Nitrogen	<0.1	% wt.
Halogens	4.4	% wt. as Cl
Aqueous Extraction	7	pH
Water (separated phase)	2	% volume
Ash	2.04	%wt.
Specific Gravity	0.90	gr/ml
PCBs	<50	PPM

Metals

Pb	<100	ppm	Ba	<100	ppm
Zn	400	ppm	Ti	200	ppm
Cr	<100	ppm	Fe	200	ppm
Se	<200	ppm	Cd	<100	ppm
V	<100	ppm	As	<200	ppm

B WASTE ANALYSIS PLAN

OMEGA has developed a comprehensive Waste Analysis Plan (WAP) for the OMEGA facility to ensure that wastes are identified properly prior to acceptance, are evaluated at the time of delivery, and are monitored during processing. A copy of the WAP is provided in Appendix C. A brief overview of this document is provided in the following sections. However, the reviewer should read the WAP in its entirety to understand fully the waste characterization procedures practiced at the facility.

The procedures set forth in the WAP are designed to ensure that OMEGA is in compliance with all EPA and DHS requirements for the sampling and analysis of wastes accepted at the facility. A copy of the WAP is available on-site at all times. The plan is reviewed periodically (approximately every year) to confirm that the waste analysis procedures described -therein are -accurate and current.

Pre-Acceptance Procedures

With certain exceptions, waste generators that desire to ship wastes to OMEGA first must provide: 1) chemical and physical data requested on a Waste Profile Sheet (WPS), or equivalent form, 2) a representative sample(s) accompanied with a properly completed Certification of Representative Sample, or equivalen form, and 3) other supporting documentation necessary to assist in the identification of the waste. All waste identification information is maintained in files at the facility. OMEGA or a contract laboratory verifies the WPS data by performing requisite confirmatory analyses on the representative sample(s). After comparing the data supplied by the generator with that obtained by onsite analyses, the OMEGA Technical Manager, Laboratory Manager, or their designee determines the acceptability of the waste based on the permit conditions for the facility and the availability of the proper waste management technique.

Waste Sampling

With certain exceptions, wastes entering the facility are sampled and analyzed for mandatory and supplemental analyses, as required, to identify and confirm the acceptability of the waste for targeted storage/treatment units. Bulk load samples are taken as soon as the truck enters the facility, whereas samples of containerized wastes are not taken until the containers have been off-loaded at the Drum Storage Unit. Once in drum storage, containers are sampled, analyzed, and/or inspected prior to further processing. Specific sampling procedures depend on both the nature of the material and the type of containment. At a minimum, the sampling methods and equipment used by OMEGA personnel for specific materials correspond to those referenced in 40 CFR 261, Appendix 1.

TABLE V-2
.Hazardous Wastes Manifested Off-Site from the OMEGA Facility in Calendar Year 1989

DHS Code	Waste Description	Quantity
134	Aqueous solutions with total organic residues less than 10%	19,300 gal
211	Halogenated solvents	1,600 gal
251	Still bottoms with halogenated organics	47,245 gal
252	Other still bottom wastes	665,000 gal
352	Other organic solids	120 tons

Sampling of small containers (e.g., drums, cartons, and other small units) varies with the nature of the waste material. For liquids, the sampling device of choice is either a Coliwasa or open tube sampler to draw a full vertical section. Light, dry powders and granules generally are sampled with a tube to obtain a vertical core. Heavier solids may be sampled by trier or shovel, or by coring with heavy tubing.

For tank trucks, tanks, or large containers, a Coliwasa or open-tube sampler is used when possible. However, it may be necessary to use a weighted bottle or bomb sampler to allow sampling of various depths. Tank sediments are sampled from a bottom sampling valve, as necessary, when not readily sampled from above. Storage/treatment tanks and associated piping have strategically located sampling ports that allow in-storage or in-process waste sampling.

Laboratory samples typically are held for a period of three months in storage cabinets in an on-site warehouse located on the facility. This allows for sample retesting if the data need to be reconfirmed, or if a problem arises with a generator's waste stream during this period. At the end of three months (as monitored by dates marked on the sample containers), the samples are commingled in collection drums and sent off-site for treatment/disposal. Most sample wastes are suitable for blending and use as supplemental fuels.

Waste Analysis

Three groups of analyses may be used at the facility to identify each waste and to indicate the most appropriate means of storage/treatment. They are mandatory analyses, unique supplemental analyses, and supplemental analyses using standard techniques. Mandatory analyses, to which all preacceptance and incoming waste loads are subject, as applicable, include basic screening procedures to ensure that the waste is the same as described on the WPS and manifest and to ensure that the proper waste management technique is used. Supplemental analyses are performed at the discretion of the Technical Manager/Laboratory Manager (or designee) to further identify the waste. Most tests are performed in accordance with standard, EPA-recognized procedures, including those referenced in EPA's Test Methods for Evaluating Solid Waste (SW -846) and the American Public Health Association's Standard Methods for the Examination of Water and Wastewater. Other tests have been improvised for certain waste handling processes when standard techniques were found to be lacking or inadequate.

Facilities Processes And Design Capacity

Prior to any decision of process treatment of the hazardous waste brought to Omega's facility. All waste must be identified as to its constituents and the hazard category or combination of hazard categories that it falls within. Waste compatibility and process compatibility is important to determine before any treatment process or storage of the waste is performed. The potential for incompatibility of wastes in storage and processing must be known.

If conclusive information is not known or available on storage and process compatibility, a controlled testing of storage and process parameters of the waste in small amounts will be done in the laboratory to determine the characteristics of the waste under the predicted operating and storage conditions. In general, the following steps would be used at Omega's facility to determine storage and process compatibility.

A. Request from the generator as much information as possible about the waste, since the information required on the waste manifest is very general and of limited use in determining operating compatibility. The generator would be asked to fill out Omega's Hazardous Waste Profile in Figure V-1. Whatever the generator can not fill out or is unknown will be tested by Omega in its laboratory or certified DHS Laboratory.

B. If a waste has not been handled previously at the facility, it will be analyzed and processed tested by use of a representative sample. The information obtained through these procedures will verify the generator's information and determine the proper treatment and conditions for handling the waste.

C. The process and storage compatibility will be determined and attached to the internal documents on the specific waste. The decision tree for this process is included in Waste Analysis Plan Appendix C.

Records on all received and processed waste material are kept in bound notebooks and in a computerized data base . These records include:

a. Physical and chemical characteristics of waste received.
b. Waste identification and handling data.
c. Production records on processed waste.
d. Initial Waste evaluation.
e. Product analysis.
f. Omega's waste analysis.

The majority of the wastes handled by this facility are designated as Hazardous waste. These wastes are primarily flammable waste products of an organic nature.

The facility also handles a smaller amount of the waste material designated as Corrosive ~~[illegible]~~ DRO and Toxic wastes. There is also handled, on occasion, some waste materials that have various designation such as TCLP toxic.

B. Methods used for the identification of hazardous waste.

The Methods used for the identification of the various hazardous wastes are shown in Table V-1 which lists the Waste Name and appropriate EPA and DHS waste codes , the Test parameter , Analytical Method, and Equipment required.

The appropriate level of analysis that is required for the various types of wastes is described in the Waste Analysis Plan in Appendix C.

C. Waste Analysis Plan for Omega Recycling at Whittier Facility.

Omega has developed an extensive Waste Analysis Plan for its facility at Whittier. This plan was developed to insure that all wastes and samples coming to the facility are properly identified and evaluated prior to acceptance and are handled in safe and environmentally proper treatment method .

A synopsis of the Waste Analysis Plan is outlined :

1. Identification of Hazardous Waste Prior to Acceptance.

Each waste shipment that passes initial inspection will be sampled and analyzed. We sample all waste shipments. The analysis of waste shipments does not always include measuring all the parameters used in our initial review of the generator's Waste Profile characterization. We select a subset of these to measure known as "key parameters", so we can

1) Obtain the best indication of waste treatability within given time and labor constraints.

2) Identify any ignitable, reactive, or incompatible wastes that may be present.

The key parameters are selected based on

The need to identify any restricted wastes

Waste characteristics that affect treatment process performances

The ignitability, reactivity, or incompatibility of the wastes

Those parameters that best indicate waste characteristics change.

Sampling

The sampling procedures have been developed by first identifying the wastes' physical/chemical properties and means of containment, e.g. tanker truck. Appropriate representative sampling techniques, devices, and containers that are compatible with wastes to be sampled. Any special waste handling requirements will be used based on literature, work history, and generator information.

Wastes arriving in 55 gallon drums are sampled at midlevel in the drum through the bung opening. Each drum is sampled and identified.

Tanker trucks will be sampled through access ports in the tanks. Various ports on the truck will be sampled to confirm samples are representative of waste.

(b) Methods

Quality Assurance Methods and protocol for evaluations are included in Appendix C.

2. Identification of Hazardous Waste after Acceptance.

A record of all received waste material (both bulk and in drums) is kept in a bound Waste Container Log Book. Each individual drum is identified by code. This code can traced back to specific manifest and customer. Every container is labeled and analyzed according to need to verify contents to incoming approved Waste Profile from customer. This data is then placed in a computerized data base for ease of reference and as a back up to the original written record. All incoming waste material is identified and recorded in the Log Book as to the type and quantity (Appendix C).

4. Methods and techniques are reviewed at our monthly supervisor's meetings.

5. The waste analysis plan is reviewed on annual basis to insure conformance with current regulations and rules. It is reviewed should any major piece of legislation be passed and signed into law to insure that Omega is conforming to the current and most recent legislation.

WASTES ACCEPTED AT FACILITY WHICH ARE EXEMPTED FROM MANIFEST AND REPORTING REQUIREMENTS

Omega accepts Chlorofluorocarbon refrigerants that have been exempted from the manifesting and RCRA requirements by both EPA and DHS. The letters exempting this type of waste are shown in Figure V-3 a letter from the DHS to EPA stating that DHS does not consider CFC refrigerants regulated under State of California regulations. Figure V-4 is excerpt from Federal Register exempting CFC type refrigerants from the RCRA requirements.

OMEGA RECOVERY SERVICES

WASTE DATA PROFILE NO B ____________

GENERATOR INFORMATION

Generator Name: ____________

Technical Contact ____________ Phone No. ( ) ____________

Emergency Contact ____________ Phone No.( ) ____________

Generator USEPA ID #: ____________ State ID : ____________

Address: ____________

City: ____________ State: ____________ Zip: ____________

PICK UP INFORMATION

Special pick up requirements or location : ____________

GENERAL WASTE DESCRIPTION

Name of Waste: ____________

Process generating Waste: ____________

Quantity Generated: ____________ Unit ____________ Per (Year/Month) ____________

SHIPPING INFORMATION

EPA Waste Codes: ____________

State Waste Codes: ____________

DOT Shipping Name: ____________

DOT Hazard Class: ____________

DOT UN/NA #: ____________ RQ(pounds) ____________

METHOD OF SHIPMENT

Drums: Type/Size ____________ Bulk:Type/Size ____________

Transportation requirements: ____________

Special Needs: ____________

RECERTIFICATION REQUIREMENTS

This waste data information must be recertified (ie updated) twelve months from the date signed and thereafter recertified on an annual basis. In addition, if the characteristics of the waste change or if the generating process changes, a new Waste Data Profile must be submitted for approval prior to shipment.

 INITIAL ____________

OMEGA RECOVERY SERVICES

WASTE DATA PROFILE **NO B** ____________

REGULATORY COMPLIANCE

OSHA Listed Compounds: Indicate Actual Value, in ppm or 0 or NA for Not Applicable or **LT** for less than or **GT** for greater than regulatory concentration.

Acrylonitrile(vinyl cyanide)		Inorganic arsenic	
4-Nitrobiphenyl		Coke oven emissions	
Methyl chloromethyl ether		1,2-dibromo-3-chloropropane	
3,3'-Dichlorobenzidine (and its salt)		Asbestos	
Benzidine		alpha-Naphthylamine	
Ethyleneimine		bis-Chloromethyl ether	
2-Acetylaminofluorene		beta-Napthylamine	
N-Nitrosodimethylamine		Benzene	

The EPA land disposal restriction regulations (40 CFR 268) apply to these materials, under the following categories:

____ Solvent/dioxin (See attach. 1)
____ California list, specifically (See Attach.2)
____ "First Third" list (See Attach. 3)
____ "Second Third" list (See Attach.4)
____ "Third Third" list (See Attach.5)

This waste is either a non-wastewater or a wastewater type. Check ONE____ Non-Wastewater ____ Wastewater

Does the waste contain any of the following: Please circle of check the appropriate category.

Radioactive	Y	N	Polymerizable	Y	N
Infectious	Y	N	Pyrophoric	Y	N
Water Reactive	Y	N	Air Reactive	Y	N
Explosive	Y	N	Shock Sensitive	Y	N
Oxidizer	Y	N	Reactive Sulfide	Y	N
Reactive Cyanide	Y	N	Polychlorobiphenyls (PCB)	Y	N

CHEMICAL COMPOSITION (Must add up to 100%)

Chemical Name (Generic)	CASRN	Concentration (Unit/Vol/Wt)	RQ (lbs)

OMEGA RECOVERY SERVICES

WASTE DATA PROFILE **NO B**

PROPERTIES OF WASTE

Color		Odor	
Physical State	Gas	Liquid	Solid
Phases	Single Layer	Double layer	Multi-layer
Specific Gravity		Viscosity (CPS@25C)	
pH		Melting Point F	
Flash Point		Boiling Point F	
Water (wt%)		Sulfur (Wt %)	
BTU 's per pound		Suspended Solids (Wt %)	
Halogen Content(Iodine, Bromine,Chlorine,Fluorine		Vapor Pressure (mmHg at Temp)	
Ash Content (Wt %)		Cyanide %	
Additional Information			

ELEMENTAL ANALYSIS: TCLP INORGANICS(MG/L)

Indicate Actual Value, or 0 (Use **LT** for less than or **GT** for greater than regulatory concentration)

D004	Arsenic (5.0 mg/l)		D008	Lead (5.0 mg/l)	
D005	Barium (100.0 mg/l)		D009	Mercury (0.2 mg/l)	
D006	Cadmium (1.0 mg/l)		D010	Selenium (1.0 mg/l)	
D007	Chromium (5.0 mg/l)		D011	Silver (5.0 mg/l)	

TCLP ORGANICS (MG/L)

Indicate Actual Value, or 0 (Use **LT** for less than or **GT** for greater than regulatory concentration)

D018	Benzene (0.5 mg/l)		D032	Hexachlorobenzene (0.13 mg/l)	
D019	Carbon Tetrachloride(0.5 mg/l)		D032	Hexachlorobutadiene (0.5 mg/l)	
D020	Chlordane (0.03 mg/l)		D013	Lindane (0.4 mg/l)	
D021	Chlorobenzene (100.0 mg/l)		D014	Methoxychlor (10.0 mg/l)	
D022	Chloroform (6.0 mg/l)		D035	Methyl Ethyl Ketone (200.0 mg/l)	
D023	o-Cresol (200.0 mg/l)		D036	Nitrobenzene (2.0 mg/l)	
D024	m-Cresol (200.0 mg/l)		D037	Pentachlorophenol (100.0 mg/l)	
D025	p-Cresol (200.0 mg/l)		D038	Pyridine (5.0 mg/l)	
D026	Cresol (200.0 mg/l)		D039	Tetrachloroethylene (0.7 mg/l)	
D016	2,4-D (10.0 mg/l)		D015	Toxaphene (0.5 mg/l)	
D027	1,4-Dichlorobenzene (7.5 mg/l)		D040	Trichloroethylene (0.5 mg/l)	
D028	1,2-Dichloroethane (0.5 mg/l)		D041	2,4,5-Trichlorophenol(400.0 mg/l)	
D029	1,1-Dichloroethylene (0.7 mg/l)		D042	2,4,6- Trichlorophenol(2.0 mg/l)	
D030	2,4-Dinitrotoluene (0.13 mg/l)		D017	2,4,5-TP Silvex (1.0 mg/l)	
D012	Endrin (0.02 mg/l)		D043	Vinyl Chloride (0.2 mg/l)	
D031	Heptachlor (0.008 mg/l)				

OMEGA RECOVERY SERVICES (CAD042245001)-12504 E. WHITTIER BLVD-WHITTIER, CA 90602
(213) 698 0991

OMEGA RECOVERY SERVICES

WASTE DATA PROFILE NO B__________

TREATMENT CERTIFICATIONS

Please provide the appropriate treatment specifications as per 40 CFR 268 for each waste code and subcategory codes for the identified waste cited in this waste profile. If a waste fits the definition of more than one characteristic code, it carries multiple codes and must be treated to meet the treatment standard for each characteristic.

Constituent	Treatment Standard	CCW	CCWE

Use Addendum Sheet for additional constituents.

Please provide any additional information that may be required for the proper treatment of cited waste in this waste data profile.

____

____

____

____

REQUIRED PROTECTIVE EQUIPMENT AND PROCEDURES

Please attach all Material Safety Data Sheets, analysis reports, handling precautions, additional hazardous support information, data, and comments.

____

____

____

____

SAMPLE SUBMITTED: Any sample submitted must have a chain of custody record attached to the sample.

ACKNOWLEDGEMENT

I hereby certify and warrant that the information supplied on this form and on any attachments or supplements represents a complete and accurate identification and description of this waste material, its constituents and its known or suspected hazards. I further certify and warrant that this information is the result of an analysis of a representative sample of the waste obtained and analyzed in accordance with testing procedures of the U.S. Environmental Protection Agency or state agency or from the knowledge of the waste materials.

PRINT OR TYPE NAME:______________________ DATE:______________

SIGNATURE:______________________ TITLE:______________

ACCEPTANCE BY OMEGA:ACCEPTANCE LETTER WAS SENT TO GENERATOR

PRINT OR TYPE NAME:______________________ DATE:______________

SIGNATURE:______________________________________

OMEGA RECOVERY SERVICES (CADO42245001) 12504 E. WHITTIER BLVD-WHITTIER, CA 90602-
(213) 698 0991

FIGURE V-2

PatChem Laboratories

2205 First St. #108 • Simi Valley, CA 93065 • (805) 581-9006

Customer: Omega Recovery Services
12504 E. Whittier Blvd.
Whittier, CA 90602

Attention: Mr. Greg McKim

Sample Date: 10-1-90

Report Date: 10-23-90

Sample I.D.: 9010-4003

Subject: Colortech Graphic Inc. Sample - TCLP

Sample Location: 315 South Flower Street

Method: Sample was analyzed per EPA *Test Methods for Evaluating Solid Waste, Physical/Chemical Method* (SW-846).

Results:

PARAMETER	EPA METHOD	DETECTION LIMIT	ANALYSIS
Arsenic	7060	0.05 mg/L	< 0.05 mg/L
Barium	7080	0.1 mg/L	< 0.1 mg/L
Cadmium	7130	0.02 mg/L	< 0.02 mg/L
Chromium	7190	0.05 mg/L	0.17 mg/L
Lead	7420	0.02 mg/L	1.84 mg/L
Mercury	7471	0.05 mg/L	< 0.05 mg/L
Selenium	7740	0.1 mg/L	< 0.1 mg/L
Silver	7760	0.02 mg/L	< 0.02 mg/L

Comments: Sample was prepared per Method 3010 of SW-846 for metals analysis, after TCLP extraction.

Respectfully Submitted,

Pat Brueckner
Chemist

FIGURE V-2 A

PATCHEM LABORATORIES

2205 First St. #108 • Simi Valley, CA 93065 • (805) 581-9006

Customer: Omega Recovery Services
12504 E. Whittier Blvd.
Whittier, CA 90602

Attention: Mr. Greg McKim

Sample Date: 10-1-90 Sample I.D.: 9010-4003 (Page 2 of 3)

Subject: Colortech Graphic Inc. Sample (315 South Flower Street) - TCLP

Method: Sample was analyzed per EPA Method 8240/8270 of *Test Methods for Evaluating Solid Waste, Physical/Chemical Method* (SW-846).

Results:

PARAMETER	DETECTION LIMIT	ANALYSIS
Benzene	0.05 mg/L	< 0.05 mg/L
Carbon Tetrachloride	0.05 mg/L	< 0.05 mg/L
Chlordane	0.05 mg/L	< 0.05 mg/L
Chlorobenzene	0.05 mg/L	< 0.05 mg/L
Chloroform	0.05 mg/L	< 0.05 mg/L
o-Cresol	0.05 mg/L	< 0.05 mg/L
m-Cresol	0.05 mg/L	< 0.05 mg/L
p-Cresol	0.05 mg/L	< 0.05 mg/L
Cresol	0.05 mg/L	< 0.05 mg/L
2,4-D	0.05 mg/L	< 0.05 mg/L
1,4-Dichlorobenzene	0.05 mg/L	< 0.05 mg/L
1,2-Dichloroethane	0.05 mg/L	< 0.05 mg/L
1,1-Dichloroethylene	0.05 mg/L	< 0.05 mg/L
2,4-Dinitrotoluene	0.05 mg/L	< 0.05 mg/L
Endrin	0.05 mg/L	< 0.05 mg/L
Heptachlor	0.05 mg/L	< 0.05 mg/L
Hexachlorobenzene	0.05 mg/L	< 0.05 mg/L
Heptachlorobutadiene	0.05 mg/L	< 0.05 mg/L
Lindane	0.05 mg/L	< 0.05 mg/L
Methoxychlor	0.05 mg/L	< 0.05 mg/L
Methyl Ethyl Ketone	0.05 mg/L	7200 mg/L
Nitrobenzene	0.05 mg/L	< 0.05 mg/L
Pentachlorophenol	0.05 mg/L	< 0.05 mg/L
Pyridine	0.05 mg/L	< 0.05 mg/L
Tetrachloroethylene	0.05 mg/L	< 0.05 mg/L
Toxaphene	0.05 mg/L	< 0.05 mg/L
Trichloroethylene	0.05 mg/L	64.0 mg/L
2,4,5-Trichlorophenol	0.05 mg/L	< 0.05 mg/L
2,4,6-Trichlorophenol	0.05 mg/L	< 0.05 mg/L
2,4,5-TP Silvex	0.05 mg/L	< 0.05 mg/L
Vinyl Chloride	0.05 mg/L	< 0.05 mg/L

Respectfully Submitted,

Pat Brueckner
Chemist

FIGURE V-2 B

PATCHEM LABORATORIES

2205 First St. #108 • Simi Valley, CA 93065 • (805) 581-9006

Customer:	Omega Recovery Services 12504 E. Whittier Blvd. Whittier, CA 90602
Attention:	Mr. Greg McKim
Sample Date:	10-1-90
Report Date:	10-23-90
Sample I.D.:	9010-4003 (Page 3 of 3)
Subject:	Colortech Graphic Inc. Sample - TCLP
Sample Location:	315 South Flower Street
Method:	Sample was analyzed per EPA *Test Methods for Evaluating Solid Waste, Physical/Chemical Method* (SW-846).

Results:

PARAMETER	ANALYSIS
Color	Dark Grey
Physical State	Liquid
Specific Gravity	0.920 g/ml
pH	7.6 units
Flash Point	> 70 deg. C
% Water	41 %
BTU	8560 BTU/lb
Ash	9.6 %
Odor	Strong
Melting Point	N/A
Boiling Point	62 deg. C
Sulfur	0.2 %
Suspended Solids	85 mg/L
% Cyanide	0.005 %

Respectfully Submitted,

Pat Brueckner
Chemist

FIGURE V-2 C

Example Fuel Blend

COMPOSITION OF OMEGA WASTE STREAM 16-Nov-87

CREATING A FUEL FOR OMEGA CHEMICALS COFIRING.

MINIMUM AVERAGE HEATING VALUE: = 8,000 BTU/LBM.

COMPONENT	HHV Btu/lbm.	HHV Btu/gal	SPEC GRAV (RHO):	VOL. FRAC Ai	GALLONS PER 100,000 GALS	Ai*(HHV)i
METHYLENE CHLORIDE	2,291	25,251	1.320	0	0.00	0
ACETONE	13,295	87,922	0.792	0.05	5,000.00	4,396
METHYL-ETHYL KETONE	14,620	98,272	0.805	0.023	2,300.00	2,260
1,1,1 TRICHLOROETHANE	2,969	33,195	1.339	0	0.00	0
1-BUTANOL	15,844	107,134	0.810	0	0.00	0
HEXANE	20,675	113,940	0.660	0	0.00	0
TETRACHLOROETHENE	1,641	22,239	1.623	0	0.00	0
TOLUENE	18,441	133,965	0.870	0	0.00	0
OIL #2 AND #3	19,000	142,785	0.900	0	0.00	0
ETHANOL	12,770	84,131	0.789	0.25	25,000.00	21,033
ISOPROPANOL	14,260	93,590	0.786	0.027	2,700.00	2,527
ETHYL ACETATE	10,994	82,620	0.900	0.35	35,000.00	28,917
ISOBUTYL ACETATE	12,653	92,974	0.880	0.2	20,000.00	18,595
WATER	0	0	1.000	0.1	10,000.00	0
MINERAL SPIRITS	19,840	132,531	0.800	0	0.00	0
KEROSENE	19,840	132,531	0.800	0	0.00	0
AVERAGE HHV (BTU/GAL) =		77,728		1	100,000	77,728

AVERAGE HHV = 77,728 Btu/gal

FIGURE V-2 D

Example Fuel Blend

COMPOSITION OF OMEGA WASTE STREAM 18-Nov-87

CREATING A FUEL FOR OMEGA CHEMICALS COFIRING.

MINIMUM AVERAGE HEATING VALUE: =.8,000 BTU/LBM.

COMPONENT	HHV Btu/lbm.	HHV Btu/gal	SPEC GRAV (RHO)i	VOL. FRAC Ai	GALLONS PER 100,000 GALS	Ai*(HHV)i
METHYLENE CHLORIDE	2,231	25,251	1.320	0	0.00	0
ACETONE	13,295	87,922	0.792	0.1	10,000.00	8,792
METHYL-ETHYL KETONE	14,620	98,272	0.805	0	0.00	0
1,1,1 TRICHLOROETHANE	2,969	33.195	1.339	0	0.00	0
1-BUTANOL	15,844	107,134	0.810	0	0.00	0
HEXANE	20,675	113,940	0.660	0	0.00	0
TETRACHLOROETHENE	1,641	22,239	1.623	0	0.00	0
TOLUENE	18,441	133,965	0.870	0	0.00	0
OIL #2 AND #3	19,000	142,785	0.900	0	0.00	0
ETHANOL	12.770	84,131	0.789	0.25	25,000.00	21,033
ISOPROPANOL	14,260	93,590	0.786	0	0.00	0
ETHYL ACETATE	10,994	82,620	0.900	0.35	35,000.00	28,917
ISOBUTYL ACETATE	12,653	92,374	0.880	0.2	20,000.00	18,595
WATER	0	0	1.000	0.1	10,000.00	0
MINERAL SPIRITS	19,840	132,531	0.800	0	0.00	0
KEROSENE	19,840	132,531	0.800	0	0.00	0
AVERAGE HHV (BTU/GAL) =		77,337		1	100,000	77,337

AVERAGE HHV = 77,337 Btu/gal

FIGURE V-2 E

Example Fuel Blend

COMPOSITION OF OMEGA WASTE STREAM 18-Nov-87

CREATING A FUEL FOR OMEGA CHEMICALS COFIRING.

COMPONENT	HHV Btu/lbm.	HHV Btu/gal	SPEC GRAV (RHO)i	VOL. FRAC Ai	GALLONS PER 100,000 GALS	Ai*(HHV)i
METHYLENE CHLORIDE	2,291	25,251	1.320	0	0.00	0
ACETONE	13,295	87,922	0.792	0	0.00	0
METHYL-ETHYL KETONE	14,620	98,272	0.805	0	0.00	0
1,1,1 TRICHLOROETHANE	2,969	33,195	1.339	0	0.00	0
1-BUTANOL	15,844	107,134	0.810	0	0.00	0
HEXANE	20,675	113,940	0.660	0	0.00	0
TETRACHLOROETHENE	1,641	22,239	1.623	0	0.00	0
TOLUENE	18,441	133,965	0.870	0	0.00	0
OIL #2 AND #3	19,000	142,785	0.900	0	0.00	0
ETHANOL	12,770	84,131	0.789	0.5	50,000.00	42,065
ISOPROPANOL	14,260	93,590	0.786	0	0.00	0
ETHYL ACETATE	10,934	82,620	0.900	0.4	40,000.00	33,048
ISOBUTYL ACETATE	12,653	92,974	0.880	0	0.00	0
WATER	0	0	1.000	0.1	10,000.00	0
MINERAL SPIRITS	19,840	132,531	0.800	0	0.00	0
KEROSENE	19,840	132,531	0.800	0	0.00	0
AVERAGE HHV (BTU/GAL) =		75,113		1	100,000	75,113

AVERAGE HHV = 75,113 Btu/gal

FIGURE V-2 F

Example Fuel Blend

COMPOSITION OF OMEGA WASTE STREAM 18-Nov-87

COMPONENT	HHV Btu/lbm.	HHV Btu/gal	SPEC GRAV (RHO) i	VOL. FRAC Ai	GALLONS PER 100,000 GALS	Ai*(HHV)i
METHYLENE CHLORIDE	2,291	25,251	1.320	0	0.00	0
ACETONE	13,295	87,922	0.792	0	0.00	0
METHYL-ETHYL KETONE	14,620	98,272	0.805	0	0.00	0
1,1,1 TRICHLOROETHANE	2,969	33,195	1.339	0	0.00	0
1-BUTANOL	15,844	107,134	0.810	0	0.00	0
HEXANE	20,675	113,940	0.660	0	0.00	0
TETRACHLOROETHENE	1,641	22,239	1.623	0	0.00	0
TOLUENE	18,441	133,965	0.870	0	0.00	0
OIL #2 AND #3	19,000	142,785	0.900	0	0.00	0
ETHANOL	12,770	84,131	0.789	0.5	50,000.00	42,065
ISOPROPANOL	14,260	93,590	0.786	0	0.00	0
ETHYL ACETATE	10,994	82,620	0.900	0.4	40,000.00	33,048
ISOBUTYL ACETATE	12,653	92,974	0.880	0	0.00	0
WATER	0	0	1.000	0.1	10,000.00	0
MINERAL SPIRITS	19,840	132,531	0.800	0	0.00	0
KEROSENE	19,840	132,531	0.800	0	0.00	0
AVERAGE HHV (BTU/GAL) =		75,113		1	100,000	75,113

AVERAGE HHV = 75,113 Btu/gal

FIGURE V-2 G

Example Fuel Blend

COMPOSITION OF OMEGA WASTE STREAM 18-Nov-87

CREATING A FUEL FOR OMEGA CHEMICALS COFIRING.
OBJECTIVES:

MINIMUM AVERAGE HEATING VALUE: = 8,000 BTU/LBM.

COMPONENT	HHV Btu/lbm.	SPEC GRAV (RHO)i	MASS FRAC Ai	GALLONS PER 100,000 GALS	Ai*(HHV)i	Ai/(RHO)i
METHYLENE CHLORIDE	2,291	1.320	0	0.00	0	0.000
ACETONE	13,295	0.792	0.15625	18,303.04	2,077	0.197
METHYL-ETHYL KETONE	14,620	0.805	0.046875	5,402.24	685	0.058
1,1,1 TRICHLOROETHANE	2,969	1.339	0.125	8,660.80	371	0.093
1-BUTANOL	15,644	0.810	0.003125	358.01	50	0.004
HEXANE	20,675	0.660	0.007812	1,098.18	162	0.012
TETRACHLOROETHENE	1,641	1.623	0.078125	4,465.81	128	0.048
TOLUENE	18,441	0.870	0.03125	3,332.42	576	0.036
OIL #2 AND #3	19,000	0.900	0.28125	28,992.01	5,344	0.313
ETHANOL	12,770	0.789	0.0625	7,349.05	798	0.079
ISOPROPANOL	14,260	0.786	0.03125	3,688.55	446	0.040
ETHYL ACETATE	10,934	0.900	0.03125	3,221.33	344	0.035
ISOBUTYL ACETATE	12,653	0.880	0.015625	1,647.27	198	0.018
WATER	0	1.000	0.067187	6,233.28	0	0.067
MINERAL SPIRITS	19,840	0.800	0.03125	3,624.00	620	0.039
KEROSENE	19,840	0.800	0.03125	3,624.00	620	0.039
			(SUM=64/64)			
AVERAGE HHV AND SPEC GRAV =	12,418	0.928	1	100,000	12,418	1.078

HHV(BTU/GAL)= 96,199 Btu/gal
AVERAGE DENSITY= 7.75 lbm/gal

FIGURE V-2 H

Example Fuel Blend

COMPOSITION OF OMEGA WASTE STREAM 18-Nov-87

CREATING A FUEL FOR OMEGA CHEMICALS COFIRING.

MINIMUM AVERAGE HEATING VALUE, = 8,000 BTU/LBM.

COMPONENT	HHV Btu/lbm.	SPEC GRAV (RHO)i	MASS FRAC Ai	GALLONS PER 100,000 GALS	Ai*(HHV)i	Ai/(RHO)i
METHYLENE CHLORIDE	2,291	1.320	0	0.00	0	0.000
ACETONE	13,295	0.792	0.05	5,446.80	665	0.063
METHYL-ETHYL KETONE	14,620	0.805	0.023	2,465.06	336	0.029
1,1,1 TRICHLOROETHANE	2,969	1.339	0	0.00	0	0.000
1-BUTANOL	15,844	0.810	0.001	106.54	16	0.001
HEXANE	20,675	0.660	0	0.00	0	0.000
TETRACHLOROETHENE	1,641	1.623	0	0.00	0	0.000
TOLUENE	18,441	0.870	0	0.00	0	0.000
OIL #2 AND #3	19,000	0.900	0	0.00	0	0.000
ETHANOL	12,770	0.789	0.246	26,900.13	3,141	0.312
ISOPROPANOL	14,260	0.786	0.03	3,293.02	428	0.038
ETHYL ACETATE	10,994	0.900	0.35	33,552.28	3,848	0.389
ISOBUTYL ACETATE	12,653	0.880	0.2	19,608.46	2,531	0.227
WATER	0	1.000	0.1	8,627.72	0	0.100
MINERAL SPIRITS	19,840	0.800	0	0.00	0	0.000
KEROSENE	19,840	0.800	0	0.00	0	0.000
AVERAGE HHV AND SPEC GRAV =	10,965	0.863	1	100,000	10,965	1.159

HHV(BTU/GAL)= 78,990 Btu/gal
AVERAGE DENSITY= 7.20 lbm/gal

FIGURE V-2 I

Example Fuel Blend

COMPOSITION OF OMEGA WASTE STREAM 16-Nov-87

CREATING A FUEL FOR OMEGA CHEMICALS COFIRING.

MINIMUM AVERAGE HEATING VALUE: = 8,000 BTU/LBM.

COMPONENT	HHV Btu/lbm.	SPEC GRAV (RHO)i	MASS FRAC Ai	GALLONS PER 100,000 GALS	Ai*(HHV)i	Ai/(RHO)i
METHYLENE CHLORIDE	2,291	1.320	0	0.00	0	0.000
ACETONE	13,295	0.792	0.05	5,614.72	665	0.063
METHYL-ETHYL KETONE	14,620	0.805	0.025	2,762.02	366	0.031
1,1,1 TRICHLOROETHANE	2,969	1.339	0.01	664.21	30	0.007
1-BUTANOL	15,844	0.810	0	0.00	0	0.000
HEXANE	20,675	0.660	0	0.00	0	0.000
TETRACHLOROETHENE	1,641	1.623	0	0.00	0	0.000
TOLUENE	16,441	0.870	0	0.00	0	0.000
OIL #2 AND #3	19,000	0.900	0	0.00	0	0.000
ETHANOL	12,770	0.789	0.13	14,653.78	1,660	0.165
ISOPROPANOL	14,260	0.786	0.025	2,828.79	357	0.032
ETHYL ACETATE	10,994	0.900	0.35	34,586.68	3.848	0.389
ISOBUTYL ACETATE	12,653	0.880	0.2	20,212.99	2,531	0.227
WATER	0	1.000	0.21	18,676.81	0	0.210
MINERAL SPIRITS	19,840	0.800	0	0.00	0	0.000
KEROSENE	19,840	0.800	0	0.00	0	0.000
AVERAGE HHV AND SPEC GRAV =	9,455	0.889	1	100,000	9,455	1.124

HHV(BTU/GAL)= 70,216

AVERAGE DENSITY= 7.43 lbm/gal.

FIGURE V-2 J

Example Fuel Blend

COMPOSITION OF OMEGA WASTE STREAM 18-Nov-87

CREATING A FUEL FOR OMEGA CHEMICALS COFIRING.

MINIMUM AVERAGE HEATING VALUE: = 8,000 BTU/LBM.

COMPONENT	HHV Btu/lbm.	SPEC GRAV (RHO)i	MASS FRAC Ai	GALLONS PER 100,000 GALS	Ai*(HHV)i	Ai/(RHO)i
METHYLENE CHLORIDE	2,291	1.320	0	0.00	0	0.000
ACETONE	13,295	0.792	0.05	5,602.11	665	0.063
METHYL-ETHYL KETONE	14,620	0.805	0.025	2,755.82	366	0.031
1,1,1 TRICHLOROETHANE	2,969	1.339	0	0.00	0	0.000
1-BUTANOL	15,844	0.810	0	0.00	0	0.000
HEXANE	20,675	0.660	0	0.00	0	0.000
TETRACHLOROETHENE	1,641	1.623	0	0.00	0	0.000
TOLUENE	18,441	0.870	0	0.00	0	0.000
OIL #2 AND #3	19,000	0.900	0	0.00	0	0.000
ETHANOL	12,770	0.789	0.13	14,620.86	1,680	0.165
ISOPROPANOL	14,260	0.786	0.025	2,822.44	357	0.032
ETHYL ACETATE	10,994	0.900	0.35	34,508.98	3,848	0.389
ISOBUTYL ACETATE	12,653	0.880	0.2	20,167.58	2,531	0.227
WATER	0	1.000	0.22	19,522.22	0	0.220
MINERAL SPIRITS	19,840	0.800	0	0.00	0	0.000
KEROSENE	19,840	0.800	0	0.00	0	0.000
AVERAGE HHV AND SPEC GRAV =	9,425	0.887	1	100,000	9,425	1.127

HHV(BTU/GAL)= 69,838

AVERAGE DENSITY= 7.41 lbm/gal.

FIGURE V-2 K

Waste Fuel Constituents

Component
Methylene chloride
Acetone
Methyl Ethyl Ketone
1,1,1 Trichloroethane
1-Butanol
Hexane
Tetrachloroethene
Toluene
Oil no. 2 and 3
Ethanol
Isopropanol
Ethyl acetate
Isobutyl acetate
Kerosene
Mineral spirits
Paint pigments (50 percent ash)
Combustible solids (50 percent ash)
Resins(20 percent ash) (polymeric isocynate)
Soil (100 percent ash)
Water

Metal analysis of a still bottoms mixture of the above constituents have shown concentrations in the range below. The metals concentration in the actual fuel are over 2 orders of magnitude less and are also presented.

Heavy metals	Still bottoms ppm	Fuel concentration ppm
Lead	0.3	<0.003
Silver	0.03	<0.0003
Chromium	0.09	<0.0001
Mercury	0.0002	<0.0002
Cadmium	0.21	<0.0002
Barium	0.14	<0.0014
Arsenic	0.006	<0.005
Selenium	0.0004	<0.0004

FIGURE V-2 L

SYSTECH CORPORATION
245 North Valley Road
Xenia, Ohio 45385
(513) 372-8077

Generator Omega Recovery Services — Customer Code OCW

Address 12504 East Whittier Blvd. Whittier, CA 90602 — Source Waste solvent collection

Contact/Phone Frank Ford (213) 698-0991 — Date July 1, 1987

Volume 54,000 gal/yr

EPA Waste Code(s) D001, F002, F003, F005

QUALIFICATION ANALYSIS FOR LOS ROBLES

Organics				
acetone	20.2%	Heat Content	14,000	Btus/lb
isopropanol	31.8%	Viscosity	13	cp
methylene chloride	0.6%	Solids	3	% volume
methyl ethyl ketone	3.9%	Sulfur	0.2	% wt.
1,1,1-trichloroethane	4.7%	Nitrogen	<0.1	% wt.
n-butanol	0.1%	Halogens	4.3	% wt. as Cl
trichloroethylene	0.3%	Aqueous Extraction	6	pH
MIBK	1.2%	Water (separated phase)	0	% volume
toluene	2.3%	Ash	<1	% wt.
butyl acetate	4.0%	Specific Gravity	0.88	gr/ml
ethyl benzene	1.5%	PCBs	<50	ppm
xylene	7.7%			

		Metals					
C_9 - C_{16} alkyl benzenes	2.5%	Pb	200 ppm	Ba	<100 ppm
C_5 - C_{22} aliphatics	19.2%	Zn	100 ppm	Ti	<100 ppm
	%	Cr	<100 ppm	Fe	200 ppm
	%	Cd	<100 ppm	V	<100 ppm
	%	As	<200 ppm	Se	<200 ppm
benzene	<0.1%		ppm		ppm

Note: organic composition presented as area percent of FID/GC plot.

Site Manager comments Based on analysis at Fredonia May 8, 1987, (Omega Chemical).

Technical Service Director approval [signature] 8/3/87

Technical Service Director comments

END

VI. MAJOR WASTE MANAGEMENT DEVICES USED AT THE FACILITY

There are several waste treatment units and equipment used at the OMEGA facility for the storage, recycling, treatment and transport of wastes. They are:

3,100 drum capacity Drum Storage Areas
31 waste storage/treatment tanks
3 Distillation Units
3 Thin Film Evaporation Unit
1 Reactor
1 Grinder
1 Liquid-Liquid Separation Unit

Omega has planned for expansion of the site to include additional treatment units and storage tanks. This expansion is depicted in Figure VI-1.. This expansion and improvement effort is intended to enhance the efficiency and operational capability of the facility to manage a variety of hazardous wastes as well as to provide additional safety and environmental equipment. The improvements that are planned include addition of storage/treatment tanks; *new waste treatment systems both aqueous and non aqueous; and state of the art* modernization of present operating equipment. Once the proposed changes have been implemented, the following waste management devices are expected to be in use at the facility:

Drum storage areas (see Section VI.A)
3,100 drum capacity Drum Storage Areas
15 bulk storage tanks for accumulation of drummed liquids

Bulk storage/treatment tanks (see Section VI.B)
40 waste storage/treatment tanks
1 Waste Water equalization tanks

Waste treatment systems (see Section VI.D)
6 Distillation Units.
3 Thin Film Evaporation Units
1 Liquid-Liquid Separation Unit
1 Solids Grinding Unit
1 Reactor
1 Biological Treatment Unit
1 Neutralization and Precipitation Unit
1 Solids Filtering Unit

Each of the existing and proposed waste management devices, which constitute OMEGA's RCRA-permitted facilities, are described in the following sections.

A CONTAINERS AND CONTAINER STORAGE AREAS

Omega receives containerized wastes for treatment/ processing from generators as well as generating its own containerized wastes from intermediate steps of treatment processing. They are unloaded from trucks and processes and placed into a Drum Storage Areas located at various places on the facility (see Figure VI-2). The containerized wastes are segregated and stored according to hazard class as shown in Table VI-1.

From storage, containerized wastes are transported to the appropriate treatment area via forklifts equipped with drum handling attachments. Most empty drums are sent off-site to be reconditioned; drums that are unsalvageable are crushed and disposed of as hazardous waste.

Containers holding multi phase wastes:both liquid and solid wastes, such as paint, solvent, and oil sludges, are received at the site. The recyclable liquid phase of the waste, if any, is decanted into a treatment tank and/or other containers for further processing. The remaining solids are consolidated with other compatible solid wastes in other containers. In other instances, containers of non-recyclable wastes may be repackaged at the site into containers that are more suitable for charging to an incinerator. Containerized wastes managed in this manner are manifested off-site as a hazardous waste for incineration or other appropriate treatment/disposal method.

OMEGA proposes to construct a new Drum Storage Area in the new expansion area (see Figure VI-3). The proposed unit will provide designated areas for all container handling requirements, from unloading and sampling to storage, processing, and removal. A dedicated drum storage tank farm adjacent to the proposed storage pad will be used for the collection and consolidation of pumpable container contents to minimize required container movement activities.

A.1 Container Specifications Used for Storage

All containerized wastes received at the facility must be shipped in DOT-approved containers. Depending on the generator and the type of waste, the containers may be new, used, recycled, or reconditioned. These containers can be drums, both plastic and/or steel and/or cardboard. They may range in size from 5 gallon container to 2000 pound pressure cylinder. The wastes will be stored in their original containers or transferred to other containers or tanks for treatment or transfer to other off-site facilities.

Before containers are accepted, they are inspected for leaks, corrosion, severe rusting, bulging, structural defects, and damage. The container must be constructed of and/or lined with materials that are compatible with the waste stored therein so that the ability of the container to hold the waste is not impaired. Drums must be properly labeled and manifested before they will be accepted by an Omega driver or at the facility.

A.2 Existing Drum Storage Areas Containment System

The existing Drum Storage Areas, depicted in Figure VI-2, are a 50 foot by 220-foot concrete pad located on the west side of the facility and 100 foot by 160 foot pad on the east side. The individual pads are surrounded by retaining walls and slopes gradually downward from the north end to the south end. The walls and. berms totally surround the pads and prevent run-on to or run-off from the storage areas. . Up to 3,100 drums can be stored in these areas at any one time.

As depicted on the various figures, the individual containment areas for the drum storage are bounded by concrete curbing and walls, forming a concrete containment system having a minimum volume of 10% of the total liquid volume of all of the container stored in the units. The concrete base and curbing of the container storage areas will be free of cracks or gaps. Containment capacity calculations for all secondary containment enclosures are included in Appendix O and are summarized in Table VI-2. .

The concrete containment areas are coated to ensure that the base and waste stored therein are compatible. Information regarding the sealant and coatings used are in each containment area is provided in Appendix P.

The design of the each storage area promotes drainage of any free standing liquids away from the palletized containers in each area. Each area slopes to a blind sump. Containers stored on the pallets will not come into contact with free liquid within the areas. The step-shaped retaining walls that surround the Drum Storage Unit are constructed from 6-inch reinforced concrete and cinder block

Any liquid which accumulates in a containment area will be removed by absorbent material for small spills and in the case of rain or large spills will be removed by portable air driven diaphragm pumps equipped to pump the spill material. Small spills will be pumped to compatible drums or tanks depending on the size of the spill or rain condition.

The collected material will be analyzed to determine appropriate treatment of the collected waste.

In the past, accumulated rainfall that was shown to be non-contaminated by gas chromatography analysis will be released to appropriate sewer system. Omega's present policy is to capture and remove all precipitation from secondary containment areas and treat and dispose of it as a waste. Secondary containment precipitation liquids are pretreated and sewered in accordance with the terms and conditions of the LA County Sanitation District Sewer Permit. Waste spills or leaks that are collected in secondary containment areas are removed and treated as a hazardous waste.

Drums are positioned four to a pallet, three pallets high in rows which allow access for inspection. Aisle widths will be sufficient to allow visual inspection of labels and condition of containers.

The Container Storage Areas have been certified for its intended use by a registered engineer, as documented by the certification statement presented as Figure VI-4.

A.3 Containment System for Ignitable Waste.

Only compatible wastes are stored together see Figure VI-2. Ignitable wastes will be segregated from all other wastes. They are twenty-five feet from the property line as required by the Los Angeles County Fire Department (see Figure VI-5)

The containerized wastes will be stored according to EPA and DHS codes and compatibility (see compatibility charts in Waste Analysis Plan Appendix C).

A.4 Polychlorinated Biphenyls

Drums containing PCBs above regulated levels (i.e., > 50 ppm) are not accepted at the facility.

A.5 Proposed Drum Storage Area

OMEGA proposes to construct a new Drum Storage Area in the expansion site. The new unit will provide additional environmental safety due to its improved design/construction and because the central, location will provide additional buffering of wastes from off-site locations. The proposed unit will consist of a truck loading/unloading area, waste sampling area, drum storage area, drum processing area, and drum storage tanks. Drawings and an equipment list for the proposed Drum Storage Unit are included in Appendix D.I. See Figure VI-2 Area J and K.

The foundation of the drum unloading and sampling areas will be sloped gently to a non-discharging blind sump. *The new expansion drum storage and processing areas will slope toward the blind sump.* The sloped base will promote drainage and prevent contact between containers and standing liquids. Calculations that demonstrate the adequacy of secondary containment features are provided in Appendix O The base and wall interiors will be coated with a chemical-resistant epoxy-type coating to prevent waste migration in the event of a spill or leak. All of the wastes stored in these areas will segregated from incompatible wastes.

Storage Areas and conditions will be similar to Section A.2 and A.3.

Once in the sampling area, individual containers of waste will be sampled and analyzed in accordance with the facility's Waste Analysis Plan (see Appendix C). The layout of sampling lines within the sampling and analysis bay will provide convenient access to all of the containers for sampling, marking, and inspection. Subsequent to sampling and analysis, drums will be removed from the sampling area to the proper storage area, as determined from the generator's waste characterization and by OMEGA's analytical results. The containers will remain closed during storage except when it is necessary to add or remove waste.

When a sufficient number of containers of similar waste types have accumulated in storage, they will be transported to the drum processing area using forklifts. The processing area will contain the equipment necessary to transfer the contents of the containers to one of the drum storage tanks, including drum decant wands, stationary transfer pumps, manifolded pipelines, grounding connections, etc. After the containers are emptied, they will be placed in a designated area for off-site transport. Empty containers will be transferred by truck to a recycling/reconditioning facility, or crushed and loaded onto a truck for transport to a disposal facility.

TABLE VI-1
CONTAINERIZED WASTES SEGREGATION CHART

Ignitables, Solvents, Organics, and Organic-containing Materials

Storage Area: A # of Drums: 971 Drums

This area is designated for wastes which are ignitable (Flashpoint < 140 F.), halogenated and non-halogenated solvents, organic compounds, and aqueous wastes with organic compounds. Those classified as flammable will not be stored within 25 of the property line.The specific wastes included in this category are listed below:

Characteristic Wastes
D001, D012, D013, D014, D015, D016, D017, D018, D019, D020, D021,D022, D023, D024, D025, D026, DO28, D029, D035, D037, D038, D039, D040, D043

Wastes From Non-Specific Sources
F001, F002, F003, F004, F005, F024

Wastes From Specific Sources
K001, K009,K010 - K030, K032 - K043, K060, K073, K083,
K085, K086,K093 - K099, K103 - K105

Discarded Chemical Proucts, Off-Specification Materials, and Spill Residues
P004,P022, P037, P048, P050, P051, P059, U001-U004, U007 -
U009,U019, U020, U024 - U028, U030 - U032, U034, U036,
U037,U040, U042, U044, U045, U047 - U049, U051, U052, U054
U058,U060, U061, U068 - U072, U075 - U084, U088, U101, U104,
U105,U107, U108, U110 - U113, U115, U117, U118, U121 -Ul25,
U127,U129 - U132, U139, U140, U147, U149, U150, U154, U155,
U159,U161, U162, U165, U169, U170, U181, U182, U187, U188,
U190,U196, U210, U202, U207, U208, U209 - U213, U219 -U221,
U224,U234, U239, U240, U244, U257

Container Specifications: D.O.T. Specifications - 5, SA, 5B, 5C, 5M, 5K, 17C, 17E, 17F, 17H, 37P, 42B, 42D, 34,4BW260, 110A500W,4BA,4BW300

overpacks - 6D or 37M with inside specifications 2S, 2SL, or 2U

Storage Area B is 5,000 Gallon Tank Storage

TABLE VI-1 (Continued)
CONTAINERIZED ~~WASTES~~ SEGREGATION CHART

Solvents, organics, and Organic-containing Materials

Storage Area: C of Drums: 50 Drums

This area is designated for wastes which are not ignitable (Flashpoint > 140 F.) which includes solvents, organic compounds, and aqueous wastes with organic compounds. The specific wastes included in this category are listed below:

Characteristic Wastes
D012, D013, D014, D015, D016, D017, D018, D019, D020, D021,D022, D023, D024, D025, D026, DO28, D029, D035, D037, D038, D039, D040, D043

Wastes From Non-Specific Sources
F001, F002, F003, F004, FOOS, F024

Wastes From Specific Sources
K001, K009,K010 - K030, K032 - K043, K060, K073, K083, K085, K086,K093 - K099, K103 - K105

Discarded Chemical Proucts, Off-Specification Materials, and Spill Residues
P004,P022, P037, P048, P050, P051, P059, U001-UOO4, U007 - U009,U019, U020, U024 - U028, U030 - U032, U034, U036, U037,U040, U042, U044, U045, U047 - U049, U051, U052, U054 U058,U060, U061, U068 - U072, U075 - U084, U088, U101, U104, U105,U107, U108, U110 - U113, U115, U117, U118, U121 -Ul25, U127,U129 - U132, U139, U140, U147, U149, U150, U154, U155, U159,U161, U162, U165, U169, U170, U181, U182, U187, U188, U190,U196, U210, U202, U207, U208, U209 - U213, U219 -U221, U224,U234, U239, U240, U244, U257

Container Specifications: D.O.T. Specifications - 5, 5A, 5B, 5C, 5M, 5K, 17C, 17E, 17F, 17H, 37P, 42B, 42D, 34,4BW260, 110A500W,4BA,4BW300

OverPacks - 6D or 37M with inside specifications 2S, 2SL, or 2U

TABLE VI-1
CONTAINERIZED WASTES SEGREGATION CHART

Ignitables, Solvents, Organics, and Organic-containing Materials

Storage Area: D # of Drums: 840 Drums

This area is designated for wastes which are ignitable (Flashpoint < 140 F.), halogenated and non-halogenated solvents, organic compounds, and aqueous wastes with organic compounds. The specific wastes included in this category are listed below:

Characteristic Wastes
D001, D012, D013, D014, D015, D016, D017, D018, D019, D020, D021,D022, D023, D024, D025, D026, DO28, D029, D035, D037, D038, D039, D040, D043

Wastes From Non-Specific Sources
F001, F002, F003, F004, F005, F024

Wastes From Specific Sources
K001, K009,K010 - K030, K032 - K043, K060, K073, K083, K085, K086,K093 - K099, K103 - K105

Discarded Chemical Proucts, Off-Specification Materials, and Spill Residues
P004,P022, P037, P048, P050, P051, P059, U001-U004, U007 - U009,U019, U020, U024 - U028, U030 - U032, U034, U036, U037,U040, U042, U044, U045, U047 - U049, U051, U052, U054 U058,U060, U061, U068 - U072, U075 - U084, U088, U101, U104, U105,U107, U108, U110 - U113, U115, U117, U118, U121 -Ul25, U127,U129 - U132, U139, U140, U147, U149, U150, U154, U155, U159,U161, U162, U165, U169, U170, U181, U182, U187, U188, U190,U196, U210, U202, U207, U208, U209 - U213, U219 -U221, U224,U234, U239, U240, U244, U257

Container Specifications: D.O.T. Specifications - 5, SA, 5B, 5C, 5M, 5K, 17C, 17E, 17F, 17H, 37P, 42B, 42D, 34,4BW260, 110A500W,4BA,4BW300

overpacks - 6D or 37M with inside specifications 2S, 2SL, or 2U

Storage Area E is 10,000 Gallon Tank Storage Area

TABLE VI-1 (Continued)
CONTAINERIZED WASTES SEGREGATION CHART

Solvents, Organics, and Organic-containing Materials

Storage Area: F **of Drums: 2112 Drums**

This area is designated for wastes which are not ignitable (Flashpoint > 140 F.) which includes solvents, organic compounds, and aqueous wastes with organic compounds. Those classified as flammable material will not be stored within 50 feet of the property line. The specific wastes included in this category are listed below:

Characteristic Wastes
D012, D013, D014, D015, D016, D017, D018, D019, D020, D021,D022, D023, D024, D025, D026, DO28, D029, D035, D037, D038, D039, D040, D043

Wastes From Non-Specific Sources
F001, F002, F003, F004, F005, F024

Wastes From Specific Sources
K001, K009,K010 - K030, K032 - K043, K060, K073, K083,
K085, K086,K093 - K099, K103 - K105

Discarded Chemical Proucts, Off-Specification Materials, and Spill Residues
P004,P022, P037, P048, P050, P051, P059, U001-UOO4, U007 -
U009,U019, U020, U024 - U028, U030 - U032, U034, U036,
U037,U040, U042, U044, U045, U047 - U049, U051, U052, U054
U058,U060, U061, U068 - U072, U075 - U084, U088, U101, U104,
U105,U107, U108, U110 - U113, U115, U117, U118, U121 -UI25,
U127,U129 - U132, U139, U140, U147, U149, U150, U154, U155,
U159,U161, U162, U165, U169, U170, U181, U182, U187, U188,
U190,U196, U210, U202, U207, U208, U209 - U213, U219 -U221,
U224,U234, U239, U240, U244, U257

Container Specifications: D.O.T. Specifications - 5, 5A, 5B, 5C, 5M, 5K, 17C, 17E, 17F, 17H, 37P, 42B, 42D, 34,4BW260, 110A500W,4BA,4BW300

OverPacks - 6D or 37M with inside specifications 2S, 2SL, or 2U

Storage Areas G, H, I are Tank Storage Areas

TABLE VI-1 (Continued)
CONTAINERIZED WASTES SEGREGATION CHART

Caustic Wastes

Storage Area: K # of Drums: 120 Drums

This area is designated for wastes with a pH > 7.0. These materials include hydroxides of calcium, aluminum, sodium, potassium, etc., precipitated metal hydroxides, sludges, and aqueous materials containing cyanide, sulfide, and ammonia and aqueous wastes which, because of their pH, would contain unprecipitated heavy metals. The specific wastes to be stored in this area are listed below:

Characteristic Wastes
D002, D004, - D011

Wastes From Non-Specific Sources
F006 - F012, F019

Wastes From Specific Sources
K002 - K008, K031, K046, K048 - K052, K061, K062, K069, K071, K084,, K086, K100 - K102, K106

Discarded Chemical Products, Off-Specification Materials, and Spill Residues
P011, P012, U144 - U146, U246

Container Specifications: D.O.T. Specifications - 5, SA, 5B, 5C, 5M, 5K, 17C, 17E, 17F, 17H, 37P, 34,4BW260, 110A500W,4BA,4BW300

Overpacks - 6D or 37M with inside specifications 2S, 2SL, or 2U.

TABLE VI-1 (Continued)
CONTAINERIZED WASTES SEGREGATION CHART

Acidic Wastes

Storage Area: J # of Drums: 120 Drums

This area is designated for wastes with a pH < 7.0. These wastes included acids of various concentrations and mixtures such as sulfuric, nitric, hydrochloric, hydroflouric, and chromic acids, generated by various industrial processes. These mixtures may often contain heavy metals. The specific waste categories are listed below:

<u>Characteristic wastes</u>
D002, D004 - D011

<u>Wastes from Non-Specific Sources</u>
F006, F019

<u>Wastes From Specific Sources</u>
K002 - K008, K031, K048 - K052, K061, K062, K069, K084, K086,
K100 - K120, K106

<u>Discarded Chemical Products. Off-Specification Materials, and Spill Residues</u>
P011, P012, U144 - U146, U246

<u>Container Specifications:</u> D.O.T. Specifications - 5A, 5C Type 304 ELC or 347, 37P, 34, 42B. Chromic Acid Only - 5,5A, 5B, 17B.

<u>Overpacks:</u> 6D or 37M with inside specifications 2S, 2SL, or 2U.

TABLE VI-2

Containment Areas - Capacity

Area	Tank #/or # of Drums	Capacity Required (gal.)	Capacity Available (gal.)
A	(971 Drums)	5,341	66,473
B	Tanks 1,2,3,4,5	5,000	9,167
C	(50 Drums)	275	66,473 *
D	(840 Drums)	4,625	109,208**
E	Tanks A,B,C,D,E,F	10,000	18,475
F	(2112 Drums)	11,616	109,208**
G	Tanks 7 to 14	10,000	22,122
H	Tanks 15 to 19	10,000	13,127
I	Tanks 27 to 36	8,000	32,657
J	(120 Drums)	660	1,870
K	(120 Drums	660	1,870

* This Area C is combined with Area A because of the possibility of drainage to A.
** Areas D & F are combined into one combined capacity requirement.

B WASTE STORAGE AND TREATMENT TANKS

The purpose of this section is to provide information regarding the design, installation, and operation of the various tank systems that are presently used and proposed to be used at Omega.

Design Standards and Descriptions

Table VI-7 and VI-8 and the tank specification sheets in Appendix D contain a variety of information for each tank. The design standards used are provided on the tank specification sheets. All tanks will be designed and anchored to meet the building standards for their us in seismic zone 4.

Waste Characteristics for Storage Tanks are listed in Table VI-3A.
Ancillary equipment will be designed according to the American National Standard Code for Pressure Piping, Chemical , Plant, and Petroleum Refinery Piping, (ANSI B31.3)

The characteristics of the wastes that will be placed in each tank are provided in Table VI-3 and VI-4.

Corrosion Considerations

The external shells of the tanks and any associated metal or material of construction or components of the tanks will not be in contact with soil or standing water. Therefore, the requirements of 40 CFR 264.192 (a)(3) (corrosion expert assessment) are not applicable.

Visual Inspections for Filling

All tanks greater than 2,000 gallon have independent cat walks allowing visual inspection of the interior to determine level of tank and remaining capacity during unloading and filling.

Omega presently uses thirty-one tanks ranging in capacity from 250 to 10,000 gallons for the storage and treatment of hazardous and non hazardous wastes and products.

The new expansion tanks will increase operational and improve environmental controls efficiencies and, because they will be provided with vapor collection systems, will result in the reduction of air emissions from tank-loading and unloading operations. The following sections describe the existing and proposed facility waste storage/ treatment tanks.

B.1 Existing Waste Storage/Treatment Tanks

The tanks that presently are used to store and treat hazardous wastes are depicted in Figure II-11 and described on Table VI-3. These tanks serve four primary functions:

1) treatment of wastes by settling and physical separation in tanks,
2) temporary storage of separated aqueous waste fractions or contaminated solvent products,
3) blending of solvents, still bottoms, paint pigments, etc. to meet supplemental fuel specifications,
4) accumulation of processing wastes.
5) Storage of finished products available for sale.

Most of the wastes held in facility storage and processing tanks generally are classified as Class 1, Class 11, Class IIIA, Non Flammable Gases (CFC refrigerants) or halogenated solvents.

The following tank descriptions apply to all tanks used for the storage, treatment, and blending of incoming wastes. All tanks are located aboveground and are constructed of carbon or stainless steel. Each tank is painted with a protective coating to minimize corrosion unless it is stainless. Tank liners are not required since the compatibility of carbon and stainless steel is considered to be "good" with a wide range of organic solvents (see Table VI-2). Fluid level control gauges soon will be installed on all tanks. Each tank is piped separately to preclude inadvertent waste mixing.

TABLE VI-3
Existing Storage/Treatment Tanks Omega Facility

Tank I.D	.Type	Volume (gal)	Material Handled	Purpose
1	Vertical	5,000	Solvent/Fuel waste	Storage
2	Vertical	5,000	Solvent/Fuel waste	Storage
3	Vertical	5,000	Solvent/Fuel waste	Storage
4	Vertical	5,000	Solvent/Fuel waste	Storage
5	Vertical	5,000	Solvent/Fuel waste	Storage
Heidi	Horizontal	3,500	CFC refrigerant	Storage
Jenny	Horizontal	5,500	CFC refrigerant	Storage
Farah	Horizontal	750	CFC solvent	Storage
Racquel	Horizontal	750	CFC solvent	Storage
Carrie	Vertical	2,000	Product/Waste	Storage
Connie	Vertical	2,000	Product/Waste	Storage
Elaine	Vertical	2,000	Product/Waste	Storage
Sandee	Vertical	2,000	Product/Waste	Storage
Sheila	Vertical	1,200	Liquid Waste	Storage
Peggy	Vertical	950	Liquid Waste	Storage
Cindy	Vertical	1,100	Waste/Product	Storage
Amy	Vertical	500	Waste/Product	Storage
Loudy	Vertical	500	Waste/Product	Storage
Linda	Vertical	500	Waste/Product	Storage
Diane	Vertical	500	Waste/Product	Storage
Susan	Vertical	500	Waste/Product	Storage
A	Vertical	10,000	Product/Waste	Storage
B	Vertical	10,000	Product/Waste	Storage
C	Vertical	10,000	Product/Waste	Storage
D	Vertical	10,000	Product/Waste	Storage
E	Vertical	10,000	Product/Waste	Storage
F	Vertical	10,000	Product/Waste	Storage

No specific waste designations are assigned to a tank, because all of the wastes stored in the tanks are compatible with each other and with the tank material of construction (i.e., carbon steel). Tanks are marked by identification number or name, National Fire Protection Association (NFPA) hazard designation, and, where appropriate, EPA waste designation (i.e., F001-F 005). The tank contents at any given time are described on a blackboard chart maintained in the laboratory. Facility tanks have been approved for their intended use by a egistered engineer, as documented by the certification statement presented as Certification by Registered Engineer Figure VI-6.

Table VI-3A

Waste Characteristics For Storage Tanks

Tank(s) 1 to 5; A to F,
Waste Description
This tanks are designated for wastes which are ignitable (Flashpoint < 140 F.), halogenated and non-halogenated solvents, organic compounds, and aqueous wastes with organic compounds. The specific wastes included in this category are listed below:

Characteristic Wastes
D001, D012, D013, D014, D015, D016, D017, D018, D019, D020, D021,D022, D023, D024, D025, D026, DO28, D029, D035, D037, D038, D039, D040, D043

Wastes From Non-Specific Sources
F001, F002, F003, F004, F005, F024

Wastes From Specific Sources
K001, K009,K010 - K030, K032 - K043, K060, K073, K083, K085, K086,K093 - K099, K103 - K105

Discarded Chemical Products, Off-Specification Materials, and Spill Residues
P004,P022, P037, P048, P050, P051, P059, U001-U004, U007 -U009,U019, U020, U024 - U028, U030 - U032, U034, U036, U037,U040, U042, U044, U045, U047 - U049, U051, U052, U054 ,U058,U060, U061, U068 - U072, U075 - U084, U088, U101, U104, U105,U107, U108, U110 - U113, U115, U117, U118, U121 -UI25, U127,U129 - U132, U139, U140, U147, U149, U150, U154, U155, U159,U161, U162, U165, U169, U170, U181, U182, U187, U188, U190,U196, U210, U202, U207, U208, U209 - U213, U219 -U221, U224,U234, U239, U240, U244, U257

Tank(s) Heidi, Jenny, CFC 1 to 4
Waste Description

This tanks are designated for wastes which are can be liquids under pressure. They are primarily Chlorofluorocarbons which can have ignitable (Flashpoint < 140 F.), halogenated and non-halogenated solvents, organic compounds, and aqueous wastes with organic compounds. The specific wastes included in this category are listed below:

Characteristic Wastes
D001, D018, D019, D020, D021,D022, D023, D024, D025, D026, DO28, D029, D035, D037, D038, D039, D040, D043

Wastes From Non-Specific Sources
F001, F002, F003, F004, F005, F024

Discarded Chemical Proucts, Off-Specification Materials, and Spill Residues
U044, U075,U121,U208,U209,U210,U226,U080,U228

All facility tanks are installed on concrete foundation pads or concrete encased legs that have sufficient bearing capacities to support the fully loaded tanks. The walls and dikes that surround individual process areas provide secondary containment for the waste storage/process tanks, as discussed in Appendix O. Containment walls also prevent run-on from entering a tank process area. After a rainfall event, the contained precipitation is removed by pumps for proper disposal.

Transfer operations to and from a tank or from a tank to a treatment unit are performed using pumps and flexible hoses or dedicated stainless steel pipes ASME schedule 40. Pumping rates depend on the type of chemical involved and whether the waste is being pumped from drums or trucks. During transfer operations, Omega employees monitor liquid levels to ensure that the tank/treatment unit is not being overfilled.

All tanks and associated secondary containment areas are inspected daily for signs of leakage or structural damage/deterioration. Inspection elements, described in the Inspection Plan (see Appendix E), include gauges, valves, piping, vents, seams, legs, leaks, containment walls, and areas adjacent to the tanks.

High and low level alarms will be provided as depicted on the drawings included in Appendix D.I. A tank data sheet for the storage tanks is provided in Appendix D.I.

Five 5,000-gallon and six 10,000-gallon treatment tanks are in use at the facility to process the various solvent waste streams prior to distillation (see Table VI-3). These atmospheric tanks are steel welded with an attached weak shell roof. Tanks are designed to conform with NFPA and - Underwriter - Laboratories (UL) standards and specifications so that they safely retain their contents under operating conditions.
Specifications for the 5,000-gallon processing tanks, as shown in Figure VI-7, specifications for the 10,000 gallon processing tanks, as shown in Figure VI-8 are as follows:

- 93-inch outer diameter
- 145-inch shell length cone bottom
- 1/4-inch hot-rolled carbon steel throughout
- 18-inch diameter manhole
- 4-inch special vent connection
- H-beam legs
- Shop prime, red oxide coating
- Air and soap bubble tested for leaks.

Compatible and physically similar solvent wastes are pumped into a processing tank from drums or bulk liquid vehicles, where solids and semi-solids settle out and waste fractions separate according to their densities. After a sufficient time has elapsed to allow for the completion of these physical treatment processes,different waste fractions will be drawn off for recycling via processing or for incineration or other means of treatment/disposal (aqueous fraction and tank bottoms).

Solvent wastes destined for use as supplemental fuels are pumped into one of the blending tanks using grinding and particle-sizing pumps. Tank contents are blended and particulates are kept in suspension by the use of pumps to agitate waste material.

After the material has been blended sufficiently to meet the viscosity requirement, it is pumped directly into tank trucks for off-site use as a supplemental fuel. One criterion the blended product must meet is the viscosity requirement of 100 centipoise. This typically is accomplished by blending a flammable sludge consisting of still bottoms, residues, and resinous materials with dirty, low yield lacquer thinner. (The lacquer thinner waste will have a concentration less than 55%, the point below which it is considered uneconomical to reclaim.)

Vapor Recovery
The vapor recovery line is connected-- to each processing tank with a 2-inch - fitting. Thus, air that is expelled during the filling of the blending tank is recycled to displace the wastes that are discharged from the processing tanks. A 3-inch in-line breathing vent allows for air breathing to prevent over- or under pressurization of the tanks..

B.2 Proposed Waste Storage/Treatment Tanks

Design specifications for the proposed waste storage/treatment tanks are provided on the tank data sheet included in Appendix D.3. A Design Assessment Report and tank certification statement is provided in Figure VI-10. Each tank will be mounted on externally attached support legs which will be secured directly to the foundation or to a raised pad, in accordance with installation procedures described in Appendix D.3. Three feet of clearance will be provided under each tank for associated piping and pumps and to prevent the tanks from contacting spilled or leaking waste material.1s..

A corrosion allowance of 0.14 inch will apply for the purpose of tank integrity assessment, based on the following source:

From Welded Steel Tanks for Oil Storage. API Standard 650, Appendix A, Seventh Edition, November 1980.

Corrosion Allowance = 0.14 inches

All storage/treatment tanks will be constructed to API 650 standards from A285 Grade C steel plate or equivalent. Liners will not be required because carbon steel has been demonstrated to be compatible with the various types of solvents and solvent mixtures that are received at the facility (see Table VI-2). In general, carbon or stainless steel is the material of choice for the handling and storage of organic compounds. Although several solvents have specific gravities of less than 1.0, the specific gravities of certain halogenated solvents may range up to 1.5. Tank design and corrosion allowance calculations were based on an expected maximum waste specific gravity of 1.5. Based on OMEGA's and the design engineer's prior experience, the proposed tanks have an expected life of approximately 20 years.

Each storage/treatment tank will have a pressure relief valve which vents through an emissions control system to the atmosphere (see Figure VI-9 Proposed Specifications for 10,000 Gallon Tanks). The venting will allow the tanks to be operated at ambient or near ambient pressure. Each waste storage/treatment tank also will be equipped with an emergency 3-way relief valve to provide both pressure and vacuum relief in the event of failure of the primary relief valve. Electrical grounding for all new tanks and equipment will be incorporated in the plant electrical upgrade project.

All piping used for processing liquid and transferring finished products will be constructed of carbon or stainless steel with welded fittings and 150# rated flanges. The foundation for the tanks will be constructed by grading and compacting the subfoundation soil, installing steel reinforcing bars, and pouring a minimum of 6 inches of concrete to design specifications (see Appendix D.3). The foundation will be desi gned and constructed to support the weight of the tanks and their contents and in accordance with applicable seismic standards .

Normal operations will provide for the use of smaller process feed pumps to transfer wastes between tanks or to pump wastes to the waste treatment units. Due to manifolding, the truck unloading pumps also can back up the process feed pumps. The same manifolding system will allow for tank recirculation.

Each waste storage/treatment tank will have a separate manifold waste feed and piping system. The waste will be pumped from the truck through a liquid waste filter and various valves into the waste storage/treatment tank. All valves will remain in the closed position unless waste transfer operations are taking place. Pressure indicators will be provided on either side of the portable filter to indicate when the filter should be taken out of operation for cleaning. There also will be a pressure indicator downstream from each transfer pump to monitor its operation. Bottom drain valves will enable the contents of each tank to be sampled or emptied into a vacuum truck, if necessary.

Each waste storage/treatment tank will have a level indicator with high and low level alarms. Approximately once a month, tank level indicators will be calibrated with manual measurements using a dipstick. There also will be a high level switch on each tank that will shut off all pumps to the tank.

Secondary containment will be provided for tank areas by means of below grade, sealed concrete foundations and concrete sidewalls. The foundation will be sloped to a trench that directs incident precipitation and waste leaks/spills to a blind sump in the containment area. Curbs and grading away from the containment areas will prevent run-on to the process area. The secondary containment capacity will meet applicable regulatory requirements, as demonstrated by the calculations included in Appendix O.

The waste storage/treatment tanks will be elevated by means of external support legs that are protected by a fire retardant covering. The elevation of the tanks will prevent their contact with standing liquids. The use of a concrete sealant material that is compatible with organic compounds and daily inspections of the containment area will ensure the system is impervious, free from significant cracks, and capable of containing any spills, leaks, or precipitation until they can be collected and removed.

C UNDERGROUND TANKS

No underground waste tanks are in. operation at the facility, nor are any proposed as part of the facility upgrade. Therefore, the information requirements of this section are not applicable.

TABLE VI-4
Proposed Storage/Treatment Tanks Omega Facility

Tank I.D	.Type	Volume (gal)	Material Handled	Purpose
S7	Vertical	10,000	Solvent/Fuel waste	Storage
S8	Vertical	10,000	Solvent/Fuel waste	Storage
S9	Vertical	10,000	Solvent/Fuel waste	Storage
S10	Vertical	10,000	Solvent/Fuel waste	Storage
S11	Vertical	10,000	Solvent/Fuel waste	Storage
S12	Vertical	10,000	Solvent/Fuel waste	Storage
S13	Vertical	10,000	Solvent/Fuel waste	Storage
S14	Vertical	10,000	Solvent/Fuel waste	Storage
S15	Vertical	10,000	Solvent/Fuel waste	Storage
S16	Vertical	10,000	Solvent/Fuel waste	Storage
S17	Vertical	10,000	Solvent/Fuel waste	Storage
S18	Vertical	10,000	Solvent/Fuel waste	Storage
S19	Vertical	10,000	Solvent/Fuel waste	Storage
S20	Vertical	750	Solvent/Fuel waste	Storage
S21	Vertical	750	Solvent/Fuel waste	Storage
S22	Vertical	750	Solvent/Fuel waste	Storage
S23	Vertical	750	Solvent/Fuel waste	Storage
S24	Vertical	500	Solvent/Fuel waste	Storage
S25	Vertical	500	Solvent/Fuel waste	Storage
S26	Vertical	500	Solvent/Fuel waste	Storage
P1	Vertical	1,500	Product/ waste	Storage
P2	Vertical	1,500	Product/ waste	Storage
P3	Vertical	1,500	Product/ waste	Storage
P4	Vertical	1,500	Product/ waste	Storage
P5	Vertical	1,500	Product/ waste	Storage
A27	Vertical	8,000	Aqueous waste	Storage
A28	Vertical	8,000	Aqueous waste	Storage
A29	Vertical	8,000	Aqueous waste	Storage
A30	Vertical	8,000	Aqueous waste	Storage
A31	Vertical	8,000	Aqueous waste	Storage
A32	Vertical	8,000	Aqueous waste	Storage
A33	Vertical	8,000	Aqueous waste	Storage
A34	Vertical	8,000	Aqueous waste	Storage
A35	Vertical	8,000	Aqueous waste	Storage
A36	Vertical	8,000	Aqueous waste	Storage

Table VI-4A

Waste Characteristics For Storage Tanks

Tank(s) 7 to 19 Waste Description

This tanks are designated for wastes which are ignitable (Flashpoint < 140 F.), halogenated and non-halogenated solvents, organic compounds, and aqueous wastes with organic compounds. The specific wastes included in this category are listed below:

Characteristic Wastes
D001, D012, D013, D014, D015, D016, D017, D018, D019, D020, D021,D022, D023, D024, D025, D026, DO28, D029, D035, D037, D038, D039, D040, D043

Wastes From Non-Specific Sources
F001, F002, F003, F004, F005, F024

Wastes From Specific Sources
K001, K009,K010 - K030, K032 - K043, K060, K073, K083, K085, K086,K093 - K099, K103 - K105

Discarded Chemical Products, Off-Specification Materials, and Spill Residues
P004,P022, P037, P048, P050, P051, P059, U001-U004, U007 - U009,U019, U020, U024 - U028, U030 - U032, U034, U036, U037,U040, U042, U044, U045, U047 - U049, U051, U052, U054 U058,U060, U061, U068 - U072, U075 - U084, U088, U101, U104, U105,U107, U108, U110 - U113, U115, U117, U118, U121 -UI25, U127,U129 - U132, U139, U140, U147, U149, U150, U154, U155, U159,U161, U162, U165, U169, U170, U181, U182, U187, U188, U190,U196, U210, U202, U207, U208, U209 - U213, U219 -U221, U224,U234, U239, U240, U244, U257

Tank(s) 27 to 31 Waste Description

These tanks are designated for wastes with a pH < 7.0. These wastes included acids of various concentrations and mixtures such as sulfuric, nitric, hydrochloric, hydroflouric, and chromic acids, generated by various industrial processes. These mixtures may often contain heavy metals. The specific waste categories are listed below:

Acidic waste which may be corrosive in nature (pH less than or equal to two (2). Typical examples include waste sulfuric acid (25% max.) and waste hydrochloric acid (18% max.). The wastes may be toxic but will not be ignitable.

Characteristic wastes
D002, D004 - D011

Wastes from Non-Specific Sources
F006 -F012,F019

Wastes From Specific Sources
K002 - K008, K031, K046,K048 - K052, K061, K062, K069,K071,K084, K086, K100 - K102, K106

Discarded Chemical Products. Off-Specification Materials. and Spill Residues

P011, P012, U144 - U146, U246

Table VI-4A (continued)

Waste Characteristics For Storage Tanks

Tank(s) 32 to 36
Waste Description

This area is designated for wastes with a pH > 7.0. These materials include hydroxides of calcium, aluminum, sodium, potassium, etc., precipitated metal hydroxides, sludges, and aqueous materials containing cyanide, sulfide, and ammonia and aqueous wastes which, because of their pH, would contain unprecipitated heavy metals. The specific wastes to be stored in this area are listed below:

Alkaline aqueous waste. Small amounts of metals and organic compounds may be present. The pH of the waste will be between seven (7) and 14.

Characteristic wastes
D002, D004 - D011

Wastes from Non-Specific Sources
F006 -F012,F019

Wastes From Specific Sources
K002 - K008, K031, K046,K048 - K052, K061, K062, K069,K071,K084, K086,
K100 - K102, K106

Discarded Chemical Products. Off-Specification Materials, and Spill Residues
P011, P012, U144 - U146, U246

D WASTE TREATMENT SYSTEMS

Spent solvents are the only wastes presently treated at the OMEGA facility. Treatment operations are performed using three Distillation Units and three Thin Film Evaporation Unit. Waste solvents are reclaimed by heating liquid wastes to a gaseous phase, followed by the condensation and accumulation of the clean solvent product. Waste residues from the distillation process (e.g., still bottoms) are collected and used as supplemental fuels or disposed of.

D.1 Existing Solvent Recycle

Distillation Units Paul, Craig, and Kirk have a total treatment capacity of approximately 1,500 gallons/hour. The distillation equipment associated with these units includes heat exchangers, splash stills, fractionating condensers, rundown tanks, and associated pumps and piping for transfer operations. Energy for the distillation process can be provided by either hot oil heater located on the roof or steam boiler also located on the roof.. Three cooling towers located to the south of Distillation Unit No. 1 are used for cooling return water from the condensers.

The Thin Film Evaporation Units have a designed treatment capacity of approximately 200 gallons/hour. Equipment associated with this unit includes a thin film processor, condenser, product accumulator, and associated pumps and piping. Distillation and thin film evaporator components are constructed of carbon steel for compatibility with the solvent (i.e., organic) wastes which they treat. Concrete pad foundations and secondary containment features have been provided for all treatment systems. Solvent waste treatment equipment is, and will continue to be, located in the central facility area to provide an adequate separation distance between distillation activities and occupied facility structures and property boundaries. Accessways around and within waste processing areas allow the unobstructed movement of fire trucks and equipment for fire control.

The equipment configuration of Distillation Units Paul , Craig, and Kirk are illustrated schematically in Figure VI-11,12, and 13 General treatment steps for distillation are as follows:

1) Solvent wastes from drums or bulk delivery vehicles are pumped into a cone-bottomed waste storage/treatment tank to separate recyclable from non-recyclable material.

2) After an appropriate settling period, non-recyclable materials (tank bottoms and aqueous fractions) are removed for off-site treatment/ disposal. Recyclable materials are pulled into the heat exchanger and still through flex lines under vacuum pressure.

3) The waste materials are heated with heat exchange fluid (i.e., hot oil) in the heat exchanger. Vaporized solvent fractions are drawn by vacuum through the splash still/distillation column to water-cooled condensers, where they are condensed to the liquid phase. Condensed liquids are collected in receiving/rundown tanks.

4) During the distillation process, the still bottoms (material not vaporized and condensed as distillates) are pumped into waste tanks where they are held for processing as either a supplemental fuel blend or a destructive incineration waste. Other off-site processing/disposal options may be used.

5) When the distillation process is completed, the distillate is checked for moisture content and pumped into an accumulation tank. In the accumulation tank, the moisture is removed either by phase separation or by chemical drying with potassium carbonate or other suitable dewatering agent. Separated water is pumped into a waste tank where it may be blended with other waste prior to off-site treatment/disposal.

6) When the distillate drying process is complete, the clean solvent is pumped into a product solvent storage tank.

A several process tanks are presently in service at the facility to receive the products of distillation from the Distillation/Thin Film Evaporation Units. The treated solvents that collect in these tanks essentially are product grade, although further treatment by dewatering or blending may be performed prior to sale to a customer. The tanks are round, horizontally-mounted tanks. They are constructed of stainless steel and are situated within the treatment area next to the distillation systems. Adequate secondary containment is provided for each tank, as demonstrated by the calculations for existing waste storage/treatment tanks provided at the end of this section.

D.2 Proposed Distillation Units

Two new Distillation Units (Nos. T8, T-11 in Figure VI-1) will be added to the existing systems as part of the planned facility upgrade. Engineering drawings and equipment lists for these units are provided in Appendix D.5. Each new unit will have a maximum design capacity of 1,500 gallons/hour.

Equipment will be constructed of stainless steel to ensure waste compatibility and will be installed on concrete foundations provided with secondary containment structures. With minor exceptions, primarily in equipment orientation, all three units are identical in design.

Each of the proposed waste storage/treatment tanks will be manifolded to a main delivery line that will allow direct transfer of waste solvents to one of the Distillation Units. Upon leaving the storage tanks, waste solvent materials will be pumped into a recirculating pot and recirculated through one of two heat exchangers (calandrias). The calandria will vaporize the solvent by the use of hot oil surrounding the heat exchanger tubes. This portion of the process will be controlled by temperature controls on the calandria hot oil supply, which will be located in a separate shed to the west of the process area, next to 2 process water cooling towers. Specifications for the hot oil heater and cooling towers are provided in Appendix D.4. Level controls on the recirculating pot will operate the control valve on the waste inlet connection to the tank to keep a constant fluid level as material vaporizes.

Solvent vapors from the recirculating pot will be directed to a fractionation distillation column. The reflux ratio in the column will be controlled manually or by column temperature at various points. An optional reboiler may be provided to reflux liquids below the feed tray, which will improve the recovery of light material in the feed. From the column, the bottoms (low boilers and solids) will be either recycled to the recirculation pot or pumped out to storage. Vapors leaving the column will be condensed in the main condenser. Vapors drawn off of the main condenser will be pulled via vacuum pump through a vent condenser and chilling condenser to remove more condensable solvents. Any remaining vapors will be routed through an air emissions control system prior to release to the atmosphere (see Appendix D.5).

Condensed material from the chilling condenser will be pumped to storage. Product from the main condenser and vent condenser will be drained through a seal leg into an accumulator, which then will drain into a decanter. During some operations, two liquid phases will form in the distillate. The decanter is provided to separate the two phases. The light and heavy layers will be either recycled to the distillation column or pumped to product or waste storage. Material that becomes too viscous or solids laden in the bottom of the recirculation pot will be pumped to a fuels storage tank for further processing.

A total of 15 stainless steel tanks will be used to receive the products of distillation from the proposed Distillation and Thin Film Evaporation Units (see Section VI.D.3). T The flat-bottomed tanks will be constructed of stainless steel (Type 304), as indicated on the tank data sheet presented in Appendix D.3. They will be positioned on a concrete foundation that is surrounded by walls to provide secondary containment. As with the existing rundown tanks, the proposed tanks will be used to collect the products of distillation operations. Solvents stored in these tanks may be dewatered and/or blended prior to their removal for sale or for storage at the product tank farm.

D.3 Wiped Film Processing

Generic Waste Streams

Thin-film evaporators can be used to remove or recover organic components from waste streams. The bottoms of the evaporator will have smaller amounts of volatiles than the feed, either because of the reduction in concentration or the reduction in the volume (or both). For mixed (water and organics) waste streams, a thin-film evaporator can selectively remove the water (the organics are high boiling) to improve the Btu value of the bottoms so that they can be more easily incinerated, or selectively remove the organics (the organics are low-boiling) so that the organics can be recycled or burned. Thin-film evaporators can be used to recover high-boiling water-soluble solvents, such as ethylene glycol, without adding water to the recovered product.

Specific Hazardous Wastes

Hazardous wastes which can be treated in a thin-film evaporator include waste solvents from the chemical, plastics, electronics, and pharmaceutical industries. Both halogenated and nonhalogenated organics can be recovered, together with alcohols, ketones, esters, glycols, ethers, aromatic hydrocarbons, petroleum napthas, Freon, and specialty solvents. Still bottoms, spent lubricating oil, coating residues, obsolete paints, and inks can be treated in a thin-film evaporator.

Physical Form of the Waste Stream

Thin-film evaporators are used to treat liquids and sludges. Products handled in falling-film evaporators usually have low viscosities, while agitated thin-film evaporators readily process liquids with viscosities ranging up to 10,000 cp under operating shear (equivalent to 100,000 to 400,000 cp without subjected shear, as measured by standard instruments in the laboratory).'

Waste Streams for Which It Does Not Work

Thin-film evaporators do not work well for wastes which react immediately when heated, or for extremely viscous materials. Filtering is required if the solids in the waste are comparable in size to the clearance of the rotors.

DESCRIPTION OF THE TECHNOLOGY

Chemical and Mechanical Principles

Agitated thin-film evaporators are designed to spread and continuously agitate and renew a thin layer, or film of liquid on one side of a metallic surface, with heat supplied to the other side. (see Figure VI-14)

Heat can be supplied by either steam or heated oil; heated oils are typically used to heat the waste to temperatures higher than can be achieved with 1.0 mPa or 150 psig saturated steam (> 185°C or 360°F), although higher steam pressure can be employed.

A volatile component has to be transported within the film to the interface, then vaporized. Transport of the volatile component within the film is accomplished by molecular diffusion or by eddy diffusion. Molecular diffusion, the only possibility in nonagitated laminar flow, is extremely slow and decreases with increasing viscosity of the film liquid. Eddy diffusion can be influenced and increased by adding turbulence to the film. Values of diffusivities in agitated thin film evaporators are on the order of 10^{-6} M/S, or 1,000 to 10,000 times greater than the molecular diffusivities achieved in nonagitated evaporators.'

In the removal of volatiles from aqueous or mixed hazardous wastes, the efficiency of the removal and the residual concentration of volatiles will depend upon waste viscosity and concentration, the boiling points of the volatiles, and evaporator's operating pressure and temperature. For complete separation of close-boding components by distillation, a fractionation column of adequate design can be added to an agitated thin-film evaporator, which serves as a reboiler. A thin-film evaporator with vapors flowing countercurrent to the thin liquid film can be expected to have a fractionation effect of 1.25 to 1.5 theoretical plates, as opposed to the single-plate maximum efficiency of a conventional still-pot reboiler.2

Description of the Process

There are two general configurations of mechanically agitated thin-film evaporators: horizontal and vertical. A typical unit consists of a motor-driven rotor with longitudinal blades which rotate concentrically within a heated cylinder.

In the vertical design, product enters the feed nozzle above the heated zone and is mechanically transported by the rotor and gravity down a helical path on the inner heat-transfer surface. The evaporator does not operate full of product; the liquid or slurry forms a thin film or annular ring of product from the feed nozzle to the product outlet nozzle. Holdup, or inventory, of product in a thin-film evaporator is very low-typically about 2 kg/M2 (1/2 lb/ft2) of heat-transfer surface.

With typical tip speeds of 900 to 1,200 cm/s (30 to 40 ft/s), centrifugal forces distribute the liquid feed as a thin film on the heated cylinder wall, and the wave action produced by the rotating blades provides rapid mixing and frequent surface regeneration of the thin, turbulent liquid layer on the transfer surface.

The rotor may be one of several zero-clearance designs, a rigid fixed-clearance type; or, in the case of tapered rotors, an adjustable clearance construction may be used. The clearance is the space between the shell and the periphery of the circle described by the rotor blade tips. One vertical design includes an optional residence time-control ring at the end of the thermal surface to hold back liquid (and thus build up the film thickness), for cases involving a very low bottoms product rate.

D.4. Chemical Treatment

Neutralization

a. Chemical treatment performed is pH modification -ionization of acids and bases. This reaction process creates a balance between the hydrogen ions with hydroxyl groups.

This treatment method is the same as the neutralization process described earlier. An acid and base are mixed in a plastic compatible vessel. If the acid is to be pH adjusted then a dilute base solution is mixed into the acid solution. The plastic vessel has cooling water passing through the jacket to control any excess energy released from the reaction. Conversely, if the waste is a base solution then a dilute acidic solution is added to lower the pH to a neutral level of 7.

The typical reaction is as follows:

$$HCl + NaOH \rightarrow NaCl + H_2O$$

The resulting is an inorganic salt and formation of water. The water then can be removed. This reaction produces two non-hazardous products from two hazardous waste components.

The treatment results in a aqueous solution of mineral salts and water.

Some finished material must also be adjusted to the appropriate pH level by adjusting the product with appropriate (usually minute) additions of suitable acids or alkalis (usually amines).

The resultant product is then tested to confirm the yields and type of products to insure the reaction has completed and reduced the hazardous components to non-hazardous products.

DESCRIPTION OF THE OPERATION OF THE NEUTRALIZATION AND PRECIPITATION SYSTEM (See Figure VI-15 for Schematic Flow Diagram)

Chemical feed system
Various chemicals are added to the wastewater to prepare it for flotation. These chemicals can be for flocculation, coagulation, and pH control. Each chemical is added to the wastewater through positive displacement metering pumps.

Chemical mixing
Specially designed reaction tanks equipped with mechanical mixers, assure thorough blending and mixing of chemicals with the wastewater

Pressurization system
A portion of the effluent is recycled with air through a pressurized solubilization column. This air saturated liquid is then mixed in line with the wastewater prior to entering into the flotation tank.

Automatic operation control

The level of automation available can vary from the simplest stop-start control to the most sophisticated waste treatment system control available. A reliable, highly automated control system provides a waste treatment process,that is responsive to various wastewater characteristics and regulations.

Flotation system
The combined recycled fluid and wastewater is fed into the flotation tank through a patented diffuser. At this point, the air comes out of the solution forming rapidly rising pinpoint bubbles which attach themselves to suspended solids. These solids float to the top of the tank and are efficiently removed by a rotating skimmer

Sludge storage
Floated sludge from the flotation tank is either stored or dewatered for disposal.

b. Reactions

There are four types of reactions of organic compounds can be classified: Acid-Base, substitution, Addition-elimination, and Oxidation and Reduction. These various reactions are to reduce or eliminate the hazardous potential of the various hazardous wastes .

D 4.1 CHEMICAL PRECIPITATION

Applicability to Hazardous Wastes

Chemical precipitation is a process by which a soluble substance is converted to an insoluble form either by a chemical reaction or by changes in the composition of the solvent to diminish the solubility of the substance in it. The precipitated solid wastes can then be removed by settling and/or filtration. Precipitation is commonly used to reduce the hardness of water by removing calcium and magnesium. In the treatment of hazardous waste, the process has wide applicability to the removal of toxic metals from aqueous wastes.

APPLICABILITY TO HAZARDOUS WASTES

Chemical precipitation is applicable to the treatment of aqueous hazardous wastes containing toxic constituents that may be converted to an insoluble form. This includes wastes containing the metals arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc. specific hazardous wastes identified under the Resource Conservation and Recovery Act (RCRA) to which precipitation is applicable are listed in Table VI-5

Other aqueous wastes identified under RCRA that commonly contain metals that are removable by precipitation are corrosive wastes (DO02) and spent pickle liquor, from steel-finishing operations in the iron and steel industry (KO62). The "California List" of metal-containing wastes that were specified for prohibition land disposal by the 1984 RCRA Amendments, i.e., liquid wastes containing arsenic, cadmium, hexavalent chromium, lead, nickel, selenium, and thallium at specified concentrations, are treatable by chemical precipitation.

Major industries that are sources of metal-containing wastes are metal plating polishing, steel and nonferrous metals, inorganic pigments, mining, and the electronics industry. Hazardous wastes containing metals are also generated from cleanup of uncontrolled hazardous-waste sites, e.g., as leachate or contaminated groundwater.

TABLE VI-5 RCRA-Listed Wastes Containing Metals

EPA hazardous-waste no.	Metal contaminant
D004	Arsenic
D005	Barium
D006	Cadmium
D007	Chromium
D008	Lead
D009	Mercury
D010	Selenium
D011	Silver

PROCESS DESCRIPTION

The chemical precipitation process for heavy-metal removal is implemented typically as illustrated in Figure VI-15. A chemical precipitant is added to the metal containing aqueous waste in a stirred reaction vessel. The dissolved metals are converted to an insoluble form by a chemical reaction between the soluble metal compounds and the precipitant. The resultant suspended solids are separated out by settling in a clarifier. Flocculation, with or without a chemical coagulant or settling aid, may be used to enhance the removal of suspended solids.

Several different chemical precipitants have been shown to be effective in removing heavy metals from aqueous wastes. Hydroxide precipitation using lime as the precipitant is by far the most widely used method. Most metals can also be precipitated as sulfides, and certain metals as carbonates. Sodium borohydride reducing agent, can reduce and precipitate metals as elemental metal. Descriptions of these precipitation processes are given in this subsection.

Hydroxide Precipitation

Hydroxide precipitation involves the use of calcium hydroxide (lime) or sod hydroxide (caustic) as the precipitant to remove metals as insoluble metal hydroxides. The reaction is illustrated by the following equation for precipitation a divalent metal using lime:

$$M^{++} + Ca(OH)_2 \rightarrow M(OH)_2 + Ca^{++}$$

The effluent concentration levels attainable by hydroxide precipitation are pendent on the metals present; the precipitant used; the reaction conditions, especially pH; and the presence of other materials which may inhibit precipitation. Effluent metal concentrations of less than 1.0 mg/L, and sometimes less than mg/L, approaching theoretical solubilities, are achievable.

The theoretical solubilities of several metal hydroxides are shown in Figure VI-16. As indicated by the solubility curves, the metal hydroxides are amphoteric., they are increasingly soluble at both low and high pH, and the point of minimum solubility (optimum pH for precipitation) occurs at a different pH value for every metal. At a pH at which the solubility of one metal hydroxide may be minimized the solubility of another may be relatively high. In most cases a pH between 9 and 11, selected on the basis of jar tests or operating experience with waste, produces acceptable effluent quality. For a waste containing several metals, however, more than one precipitation stage with different pH control points may be required to remove all metals of concern to desired levels. Otherwise alternative precipitant may be required.

The precipitation of chromium as chromic hydroxide requires that the chromium be present in the trivalent form; hexavalent chromium cannot be removed directly by hydroxide precipitation. Pretreatment to reduce hexavalent chromium to the trivalent sate is accomplished by lowering the pH to between 2 and 3 and adding a reducing agent such as sulfur dioxide, sodium bisulfite, sodium metabisulfite, or ferrous sulfate.

The pretreated chrome waste can then be treated, either alone or mixed with other metal-bearing wastes, by line or caustic to raise the pH to above 8 to precipitate chromic and other metal hydroxides.

Other Precipitation Processes

There are other precipitation processes that may be considered for treating wastes containing specific metallic compounds, especially where the wastes contain a single metal, where metal recovery is desired, or both. Trivalent cations such as iron, aluminum, and chromium can be selectively removed from solutions containing divalent and monovalent cations by phosphate precipitation. This may be a potentially effective method of separating and recovering a trivalent metal such as chromium from a mixed waste solution.

Barium can be precipitated as barium sulfate, a very stable, insoluble material that is nonhazardous. Selenium can be recovered from waste solutions by reaction with sulfur dioxide to precipitate elemental selenium; selenides may be removed by precipitation as the insoluble iron selenide salt; and silver may be precipitated from solution as insoluble silver chloride.

DESIGN CONSIDERATIONS

The following design considerations and alternatives related to the use of precipitation for treatment of hazardous wastes are associated either with the precipitation processes themselves or with the nature of the hazardous metal-bearing wastes to be treated. In many cases hazardous metal-bearing wastes are relatively concentrated solutions, and contain mixtures of several constituents at high concentrations. Examples are spent plating, cleaning, and pickling baths. Treatment of these wastes by precipitation often requires special design and operating procedures.

Waste Segregation and Pretreatment

In designing a precipitation system for wastes which originate from a variety of different sources, more cost-effective treatment may be achieved if certain wastes are segregated. Many metal-containing wastes that are treatable by precipitation also contain cyanide that must be removed not only to meet disposal requirements but also because it acts as a complexing agent which inhibits precipitation. Wastes which contain hexavalent chromium cannot be treated directly by hydroxide precipitation. The chromium must first be reduced to the trivalent state.

Cyanide can be pretreated for destruction to carbon dioxide and nitrogen by alkaline chlorination. Hexavalent chromium can be reduced to trivalent chromium by a reducing agent such as sulfur dioxide at low pH. Although these processes may be applied to a combined waste stream, segregation of the cyanide and hexavalent chromium wastes will allow pretreatment of smaller waste streams. This will require smaller reaction tanks and chemical feed equipment, and reduced chemical usage for pH adjustment as well as for chlorine and reducing agent since there will be less material that exerts demand for these chemicals.

D4.2 Thermal Treatment-

Because of the heating value of some waste they can be used as a fuel by various facilities that are permitted by state and federal agencies for the production of energy for that specific facility.

The potential fuels used in this waste treatment are only those wastes from D001 and D002 category. These are hazardous because of their flammable characteristics and qualify by Federal Code 264.340(b) and 264.341(b). Omega will not burn these types of wastes on its facility under this permit. It will consolidate and blend for transfer to an appropriate permitted facility.

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D 5 PHYSICAL TREATMENT

(a) Dewatering/drying

Non-aqueous liquids, that are contaminated with minor amounts of water, are dried by the following method.

The contaminated liquid is repeatedly pumped through a bed containing a drying agent such as a molecular sieve polymer or calcium chloride granules. These beds selectively remove moisture from the liquid, but they do not effect the liquid in any other way. This process is continued until the liquid's moisture level is within a specified limit.

The waste left from this process is saturated calcium chloride pellets or other hydroscopic material such as molecular sieves. These pellets are redried in an steam heating unit to return the beds back to a dry condition.

(b) Solidification/Stabilization

Wastes that have no economic value for recycling and the wastes residuals from Omega's processing systems, are solidified, in drum containers, with a solidification materials similar to cement dust or diatomacious coagulant. This waste solidification will then render a solid like material that can be packaged in a DOT certified drum for disposal at a permitted landfill or incineration site.

Through this stabilization/solidification process the four primary goals of treating hazardous waste for ultimate disposal are attained:

(1) Improved the handling and physical characteristics of the waste.

(2) To decrease the surface area across which transfer or loss of contained pollutants can occur.

(3) To limit the solubility of any pollutants contained in the waste.

(4) To detoxify contained pollutants.

These stabilized wastes would then be packaged in appropriate containers and sent to an authorized landfill or incineration facility.

(c) Fuel Production

Some wastes because of their inherent energy value should be burned as fuel and therefore avoiding wasteful disposal in landfills. With the proper blending and adjustment through chemical and physical means some waste material can be made be available to certain approved facilities for such burning. These facilities include cement kilns and industrial boilers and similar operations. These facilities are licensed by state and federal agencies to accept wastes meeting the requirements of these agencies for burning. Waste oil, flammable and alcohols fall within this grouping.

(d) Hazardous Waste Solids Grinding

Suggested Installation and Operation Instructions

1) Install unit in a recirculation loop to a mixing vessel. Mixer in the tank must be capable of stirring solids in ,suspension to prevent settling, floating and shortcutt*ing* of the recycle stream. An axial flow turbine or a high speed disperser are suggested.

2) Locate the recirculation line off the sidewall of the vessel. This will discourage very heavy tramp metal objects e.g. nuts and bolts, from exiting the vessel and jamming the GRINDING UNIT. It is strongly recommended that a magnetic strainer trap be installed directly before the GRINDING UNIT.

3) If the solids are all dried paint chips or settled sludges, then the slurry can be reduced to 100% minus 1/8' in only one pass through the GRINDING UNIT using a 1/8' discharge grid. However, if the solids contain rubbery or fibrous particles, it is neccaseary to use a larger grid e.g. 1/4' or 1/2' to prevent plugging. In order to obtain a particle size distribution 99% minus 1/8' with these larger grids, it is necesary to recirculate t solids through the GRINDING UNIT several times.

4) Solids should be added into liquid. The vessel should be at least one half full with waste solvents or fuel before solids are added through a wide grate that will prevent grossly oversized solid objects from entering the vessel.

5) A cooled and pressurized double mechanical seal is standard equipment on the GRINDING UNIT. The seal must be pressurized with liquid to a pressure that is 20 PSIG higher than the pressure on the product sidel A seal pressure of 50 PSIG will assure good sealing even if the discharge grid becomes clogged. In addition a positive flow of 0.5 GPM is absolutely required to remove heat from the seal faces. A sketch of a suggested seal system is shown in Figure VI-17.

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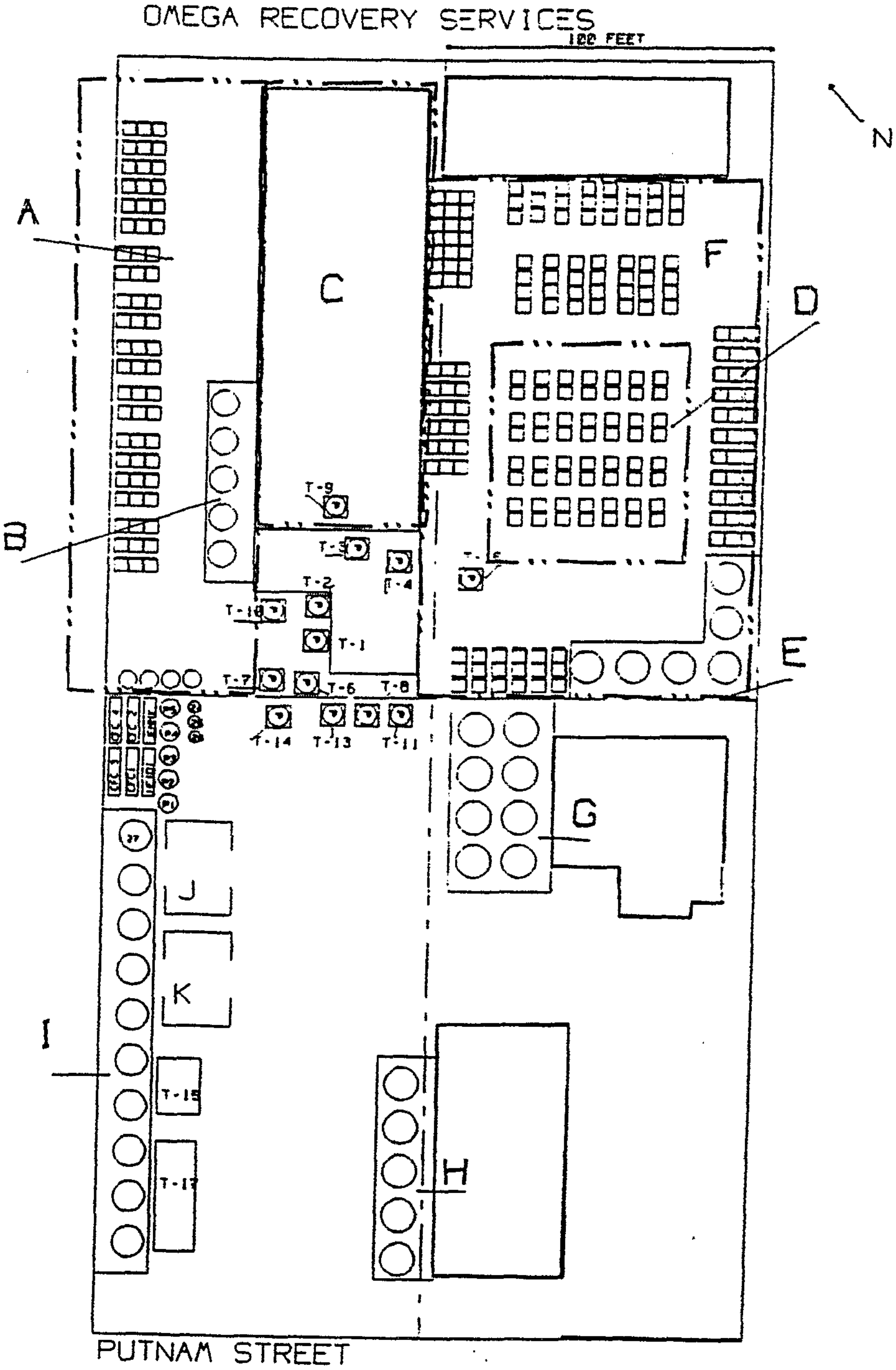
FIGURE VI-2



DRUM AND TANK STORAGE LOCATIONS

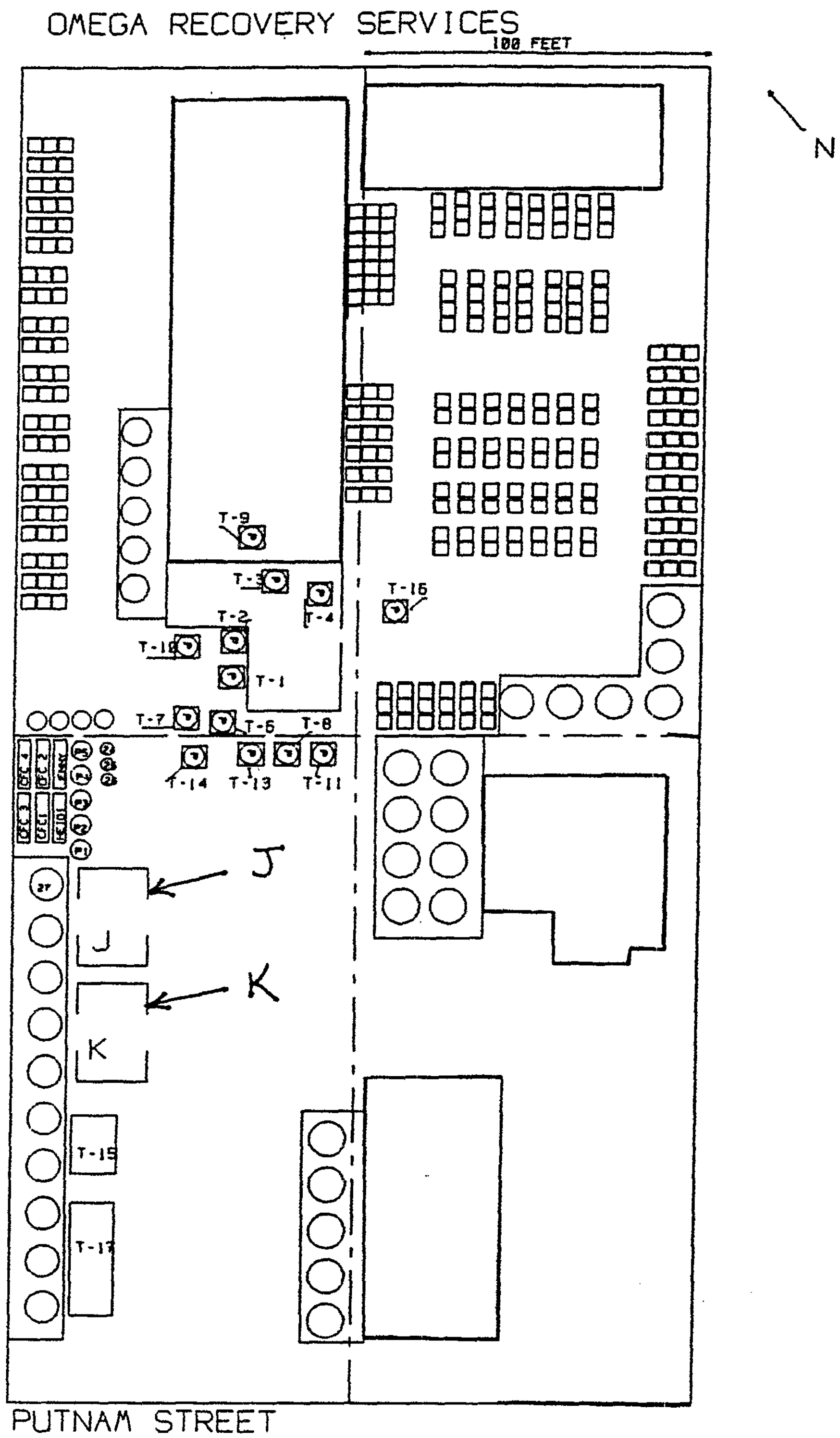


FIGURE VI-3 Proposed New Drum Storage Areas

Figure VI-4 Certification of Compliance for Container Storage Areas

The design and construction of the container storage areas, appurtenant structures, and containers located at Omega Recovery Services, 12504 E. Whittier Blvd, Whittier, California 90602, EPA ID# CAD042245001 are certified to be in compliance with the California Department of Health Services regulations for the intended uses.

Malcolm S. Jones Jr.

Registration No. C022725

Figure VI-4A Certification of Compliance for Proposed Container Storage Areas

The design and construction of the proposed container storage areas, appurtenant structures, and containers located at Omega Recovery Services, 12504 E. Whittier Blvd, Whittier, California 90602, EPA ID# CAD042245001 are certified to be in compliance with the California Department of Health Services regulations for the intended uses.

Malcolm S. Jones Jr.

Registration No. C022725

REGISTERED PROFESSIONAL ENGINEER
MALCOLM S. JONES, JR.
No. 22,725
CIVIL
STATE OF CALIFORNIA

Figure VI-5 Los Angeles County Fire Department Storage Requirements

Because these are published rules in the Fire Code you are referred to Figure XI-2 Los Angeles County Hazardous Materials Permit Plan which details the plan submitted to the LACFD for the storage and of hazardous material.

Figure VI-10 [Reserved for Future Use]

OMEGA RECOVERY SERVICES
Engineering Sketchs/Drawings

Sheet No. ____ of ____
Date ____
By ____
App ____

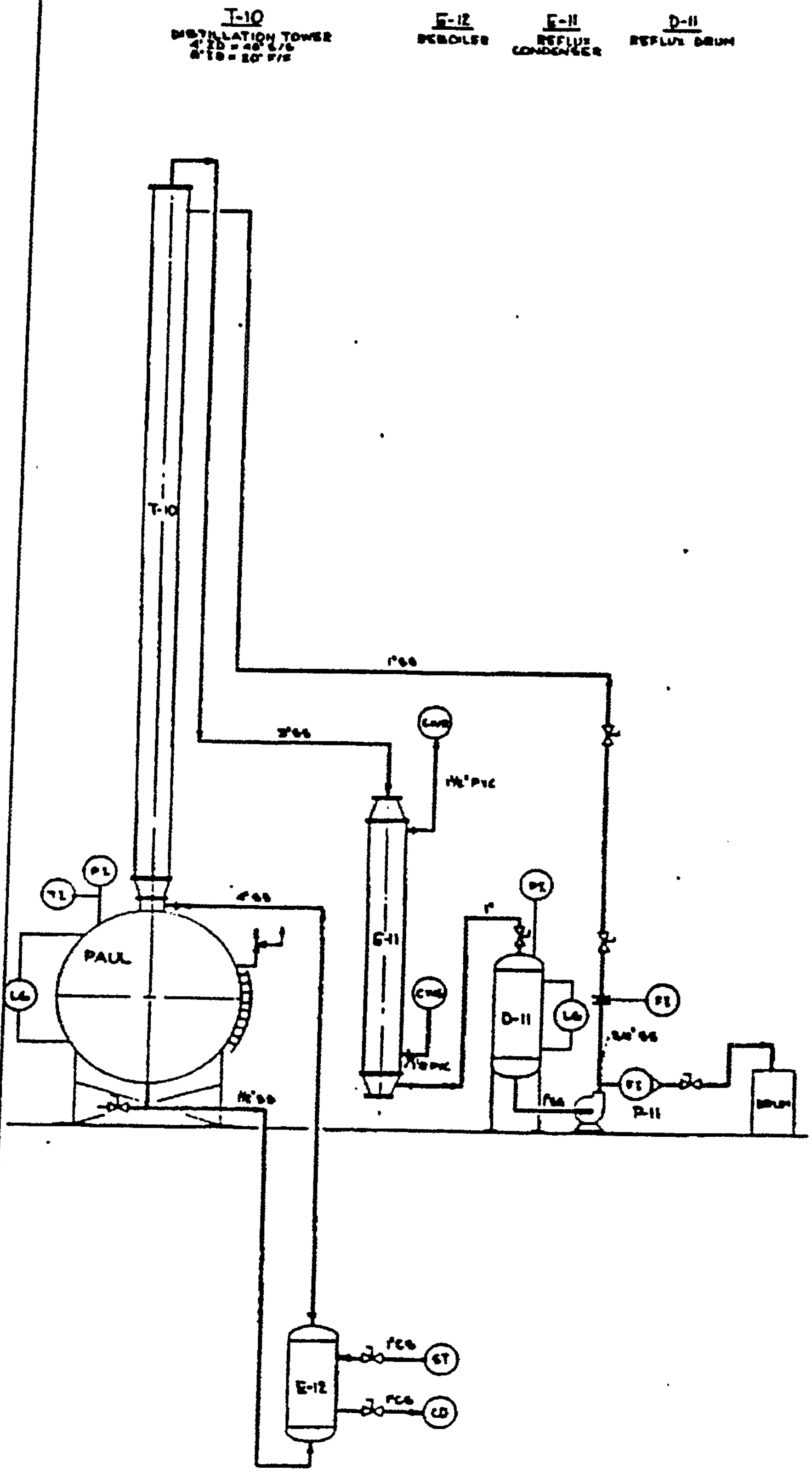


Figure VI-11 Schematic Drawing of Paul- Distillation Unit

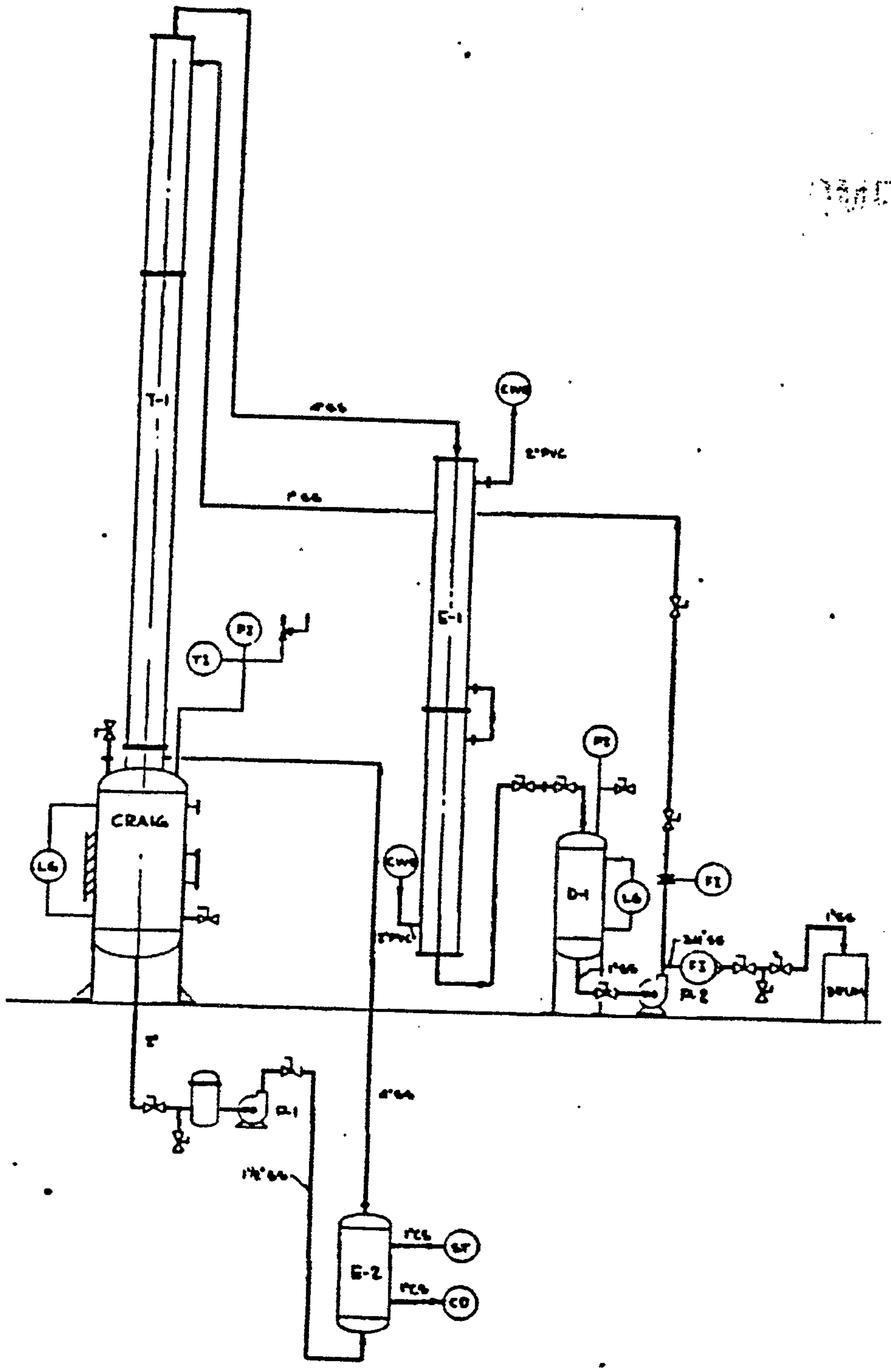


Figure VI-12 Schematic Drawing of Craig- Distillation Unit

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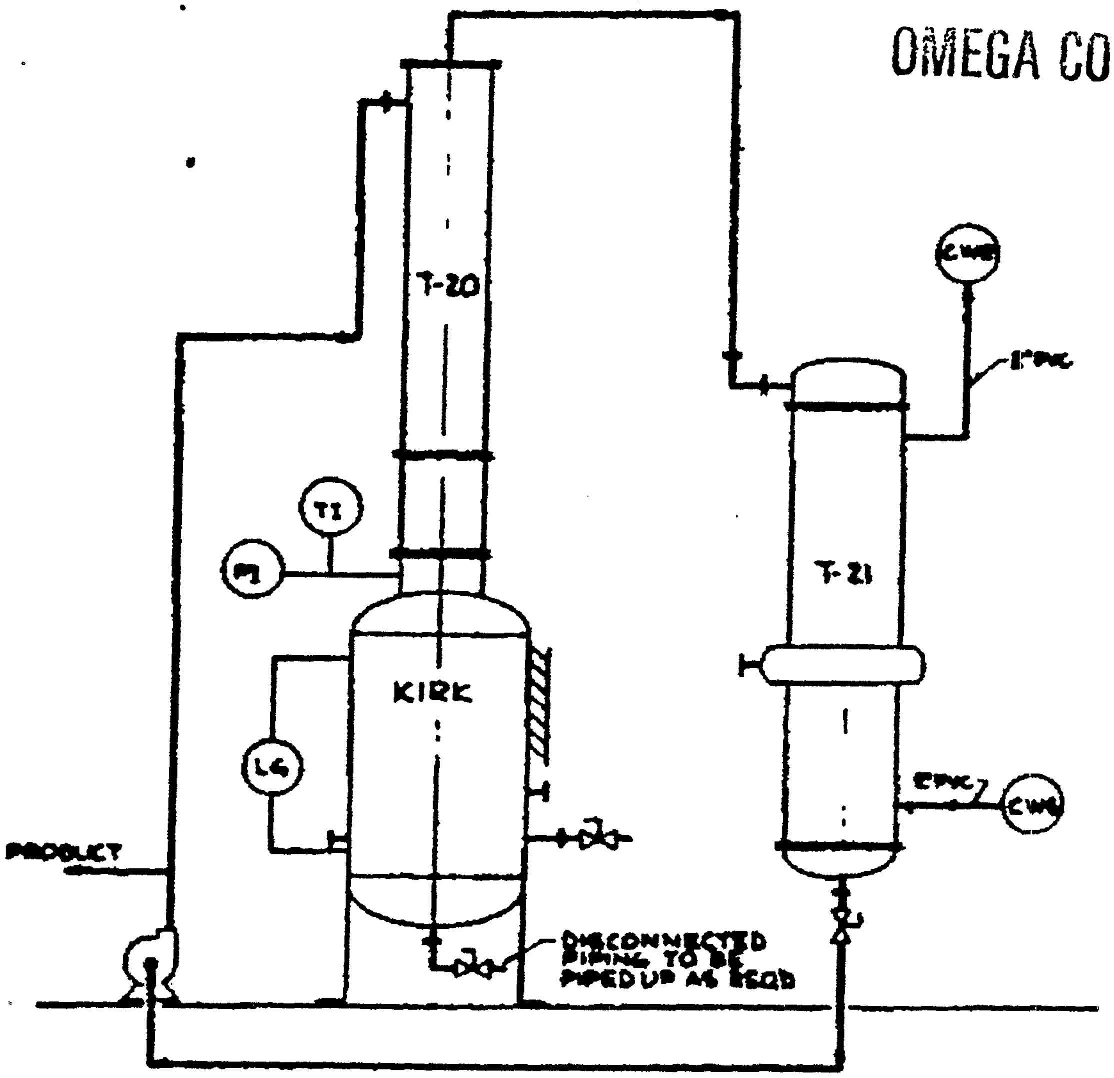


Figure VI-13 Schematic Drawing of Kirk- Distillation Unit

FIGURE VI-14

Schematic Drawing of Jake Wiped Film Evaporator

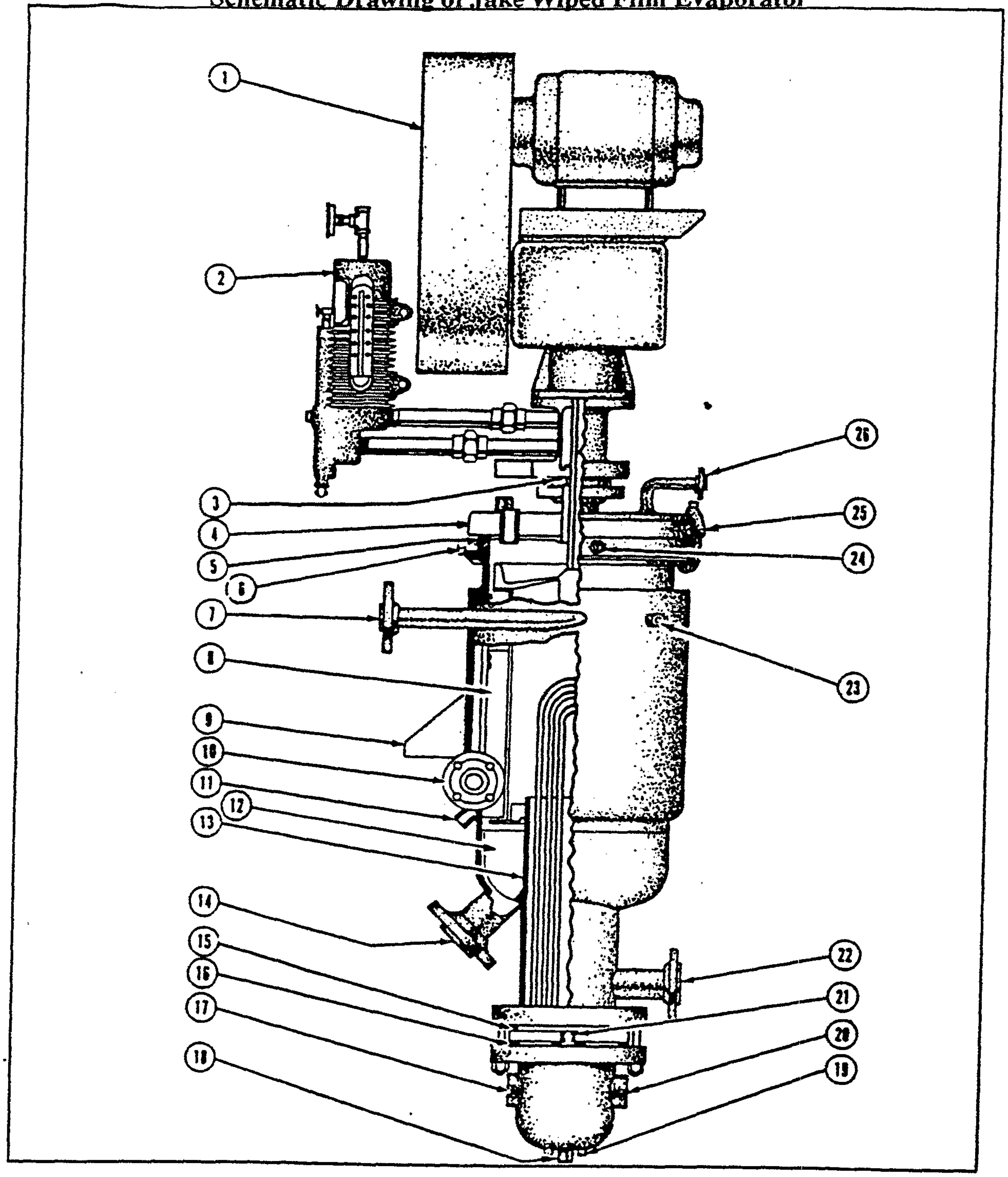
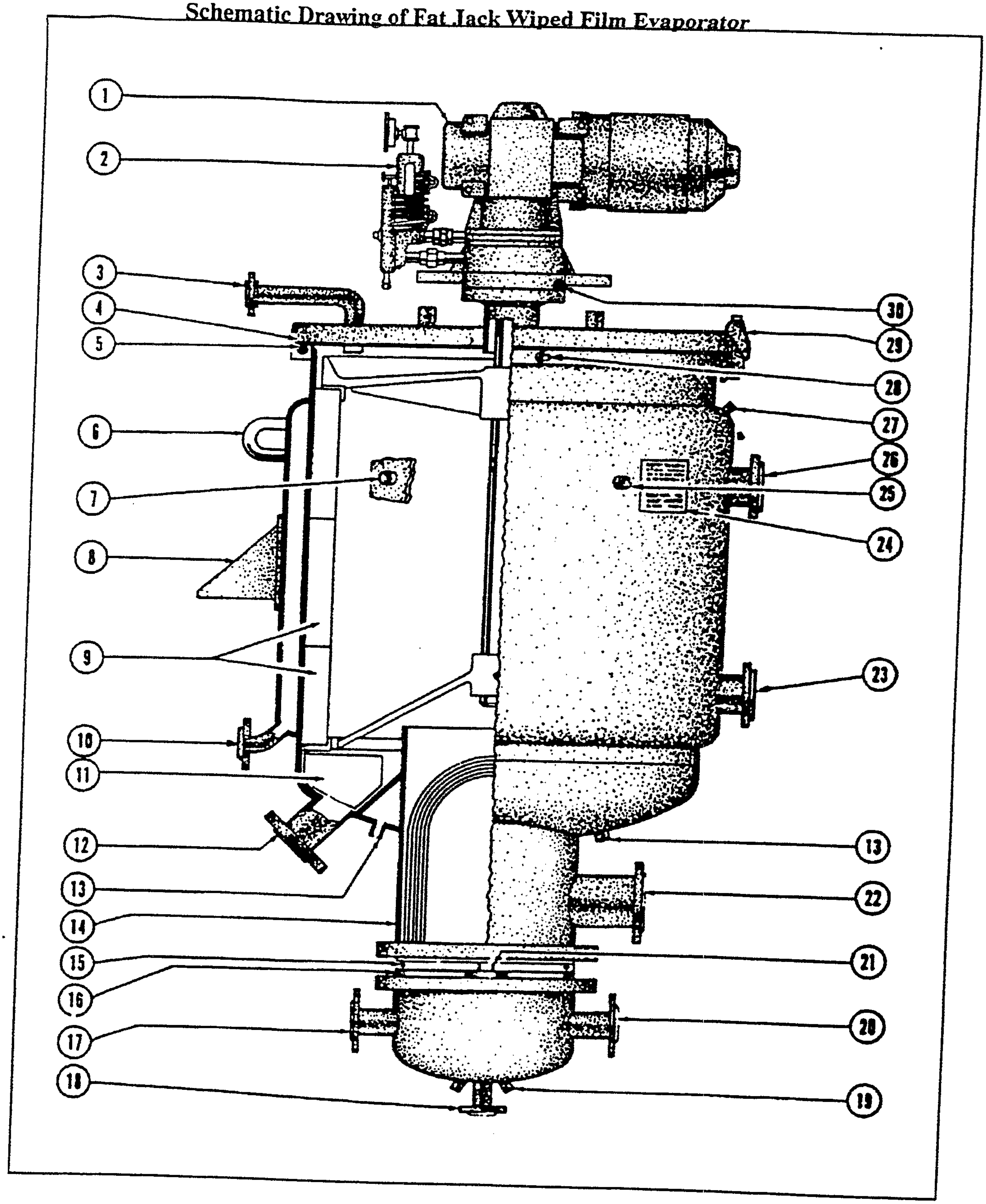


FIGURE VI-14 A

Schematic Drawing of Fat Jack Wiped Film Evaporator



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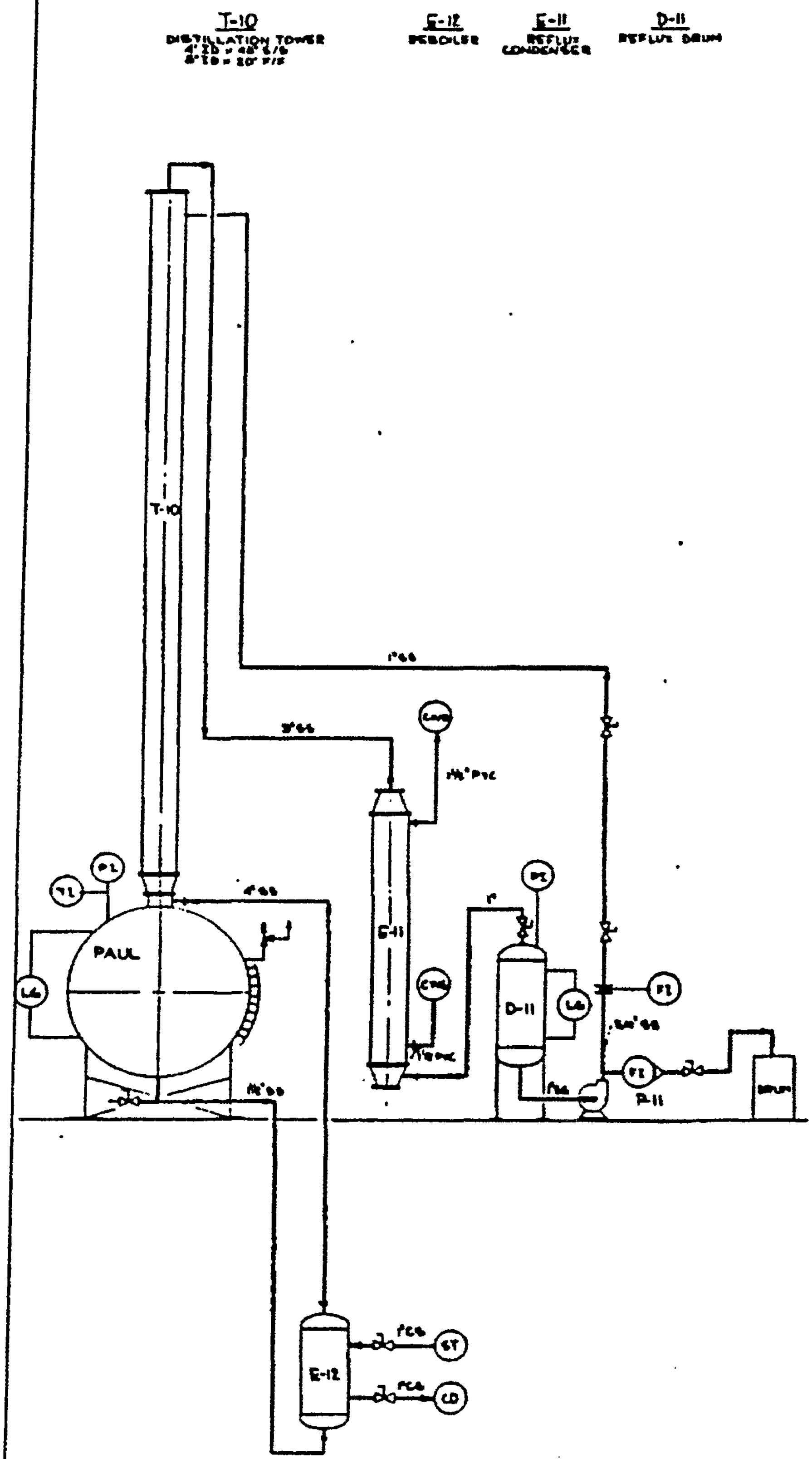

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Figure VI-11 Schematic Drawing of Paul- Distillation Unit

Sheet No. ___ of ___
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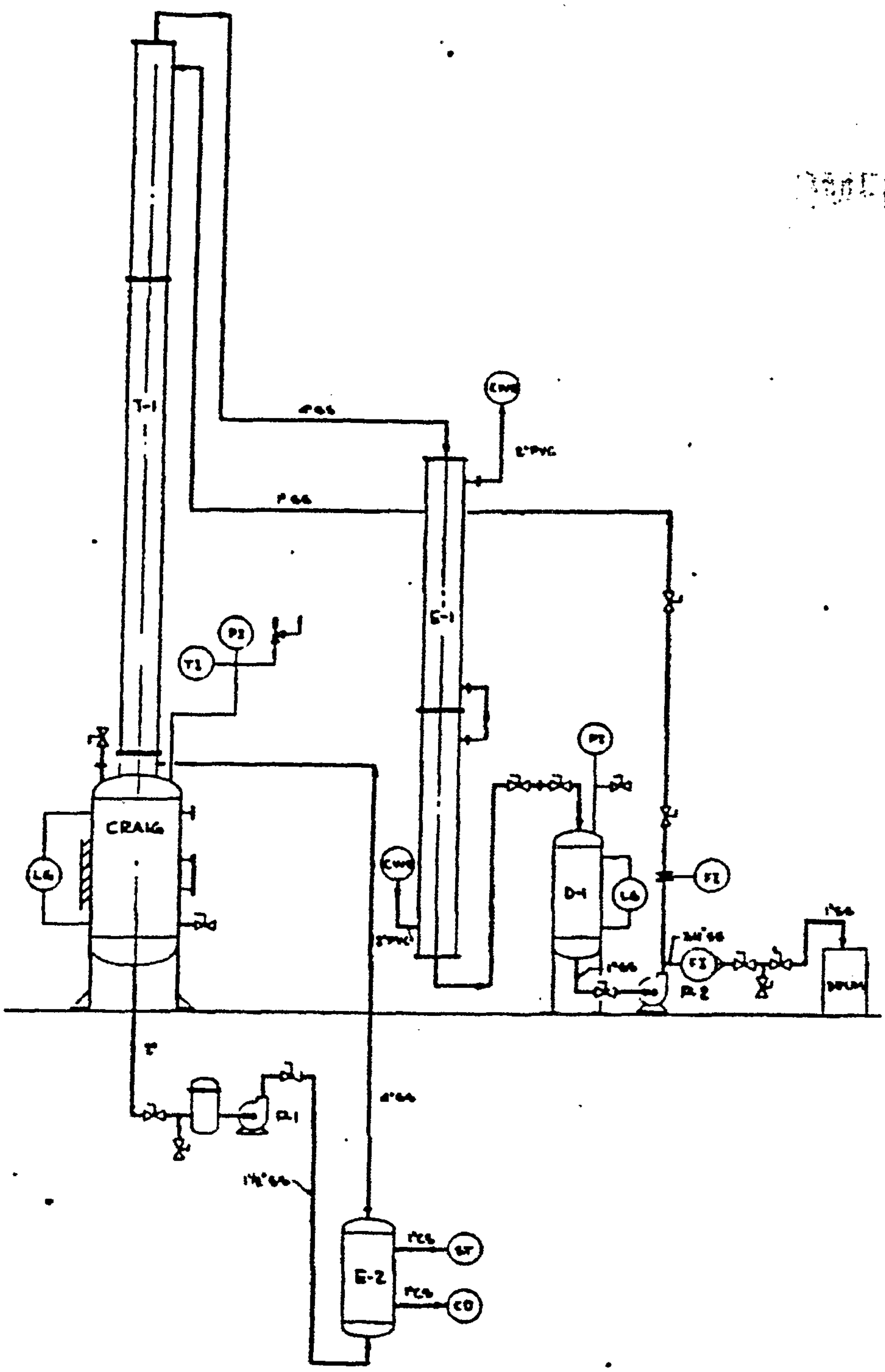

Figure VI-12 Schematic Drawing of Craig- Distillation Unit

Sheet No. ___ of ___
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By ___
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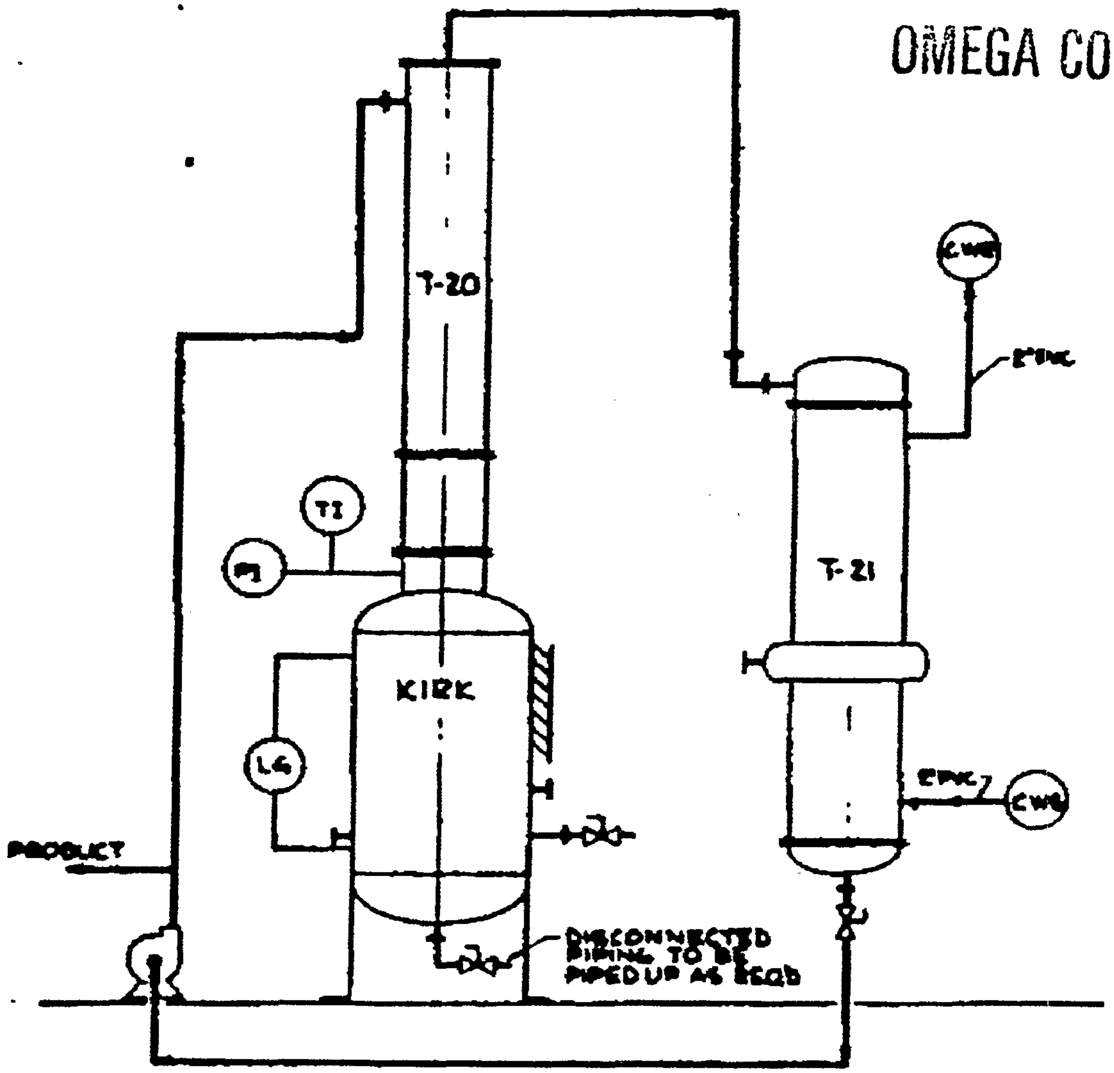


Figure VI-13 Schematic Drawing of Kirk- Distillation Unit

FIGURE VI-14

Schematic Drawing of Jake Wiped Film Evaporator

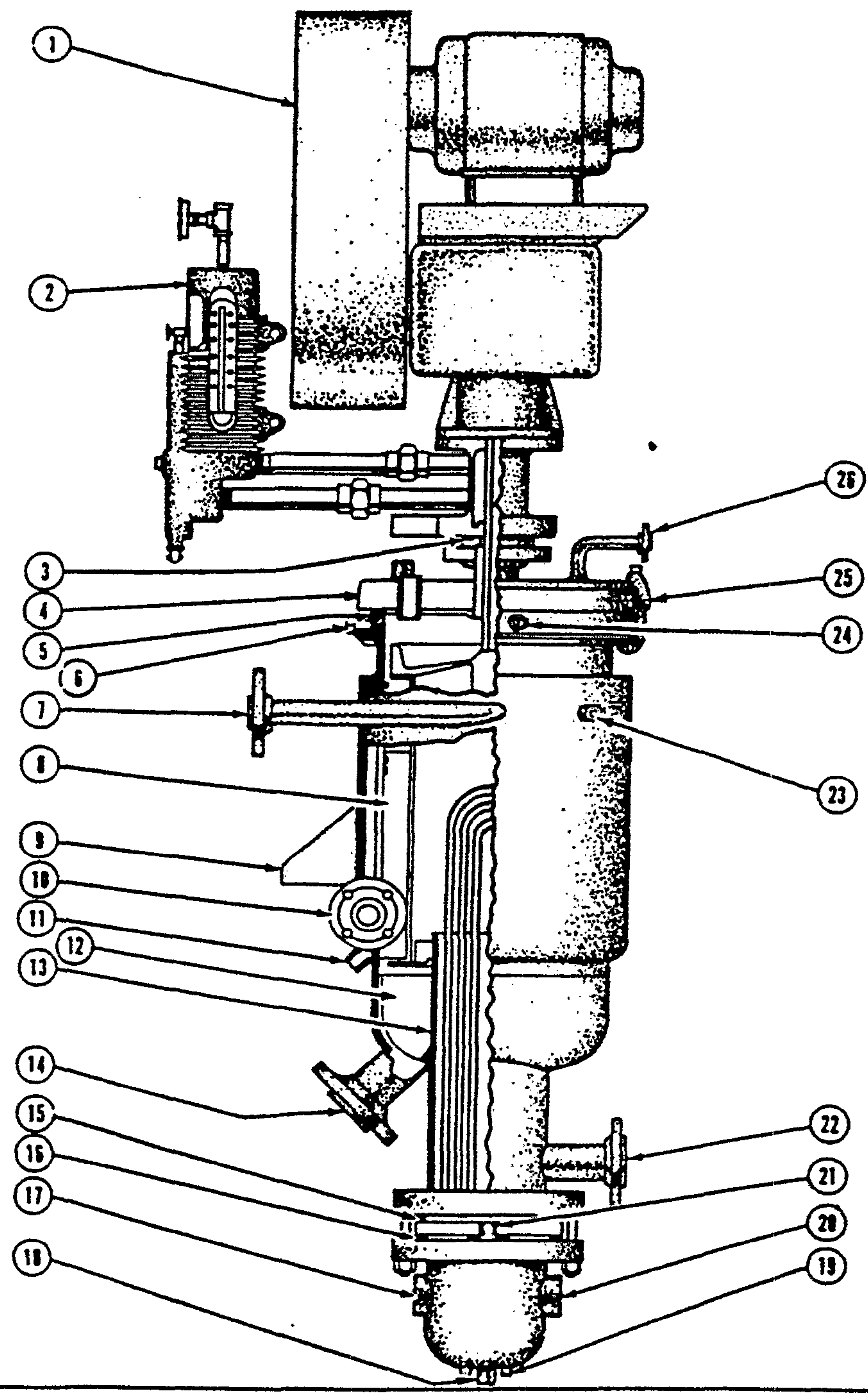
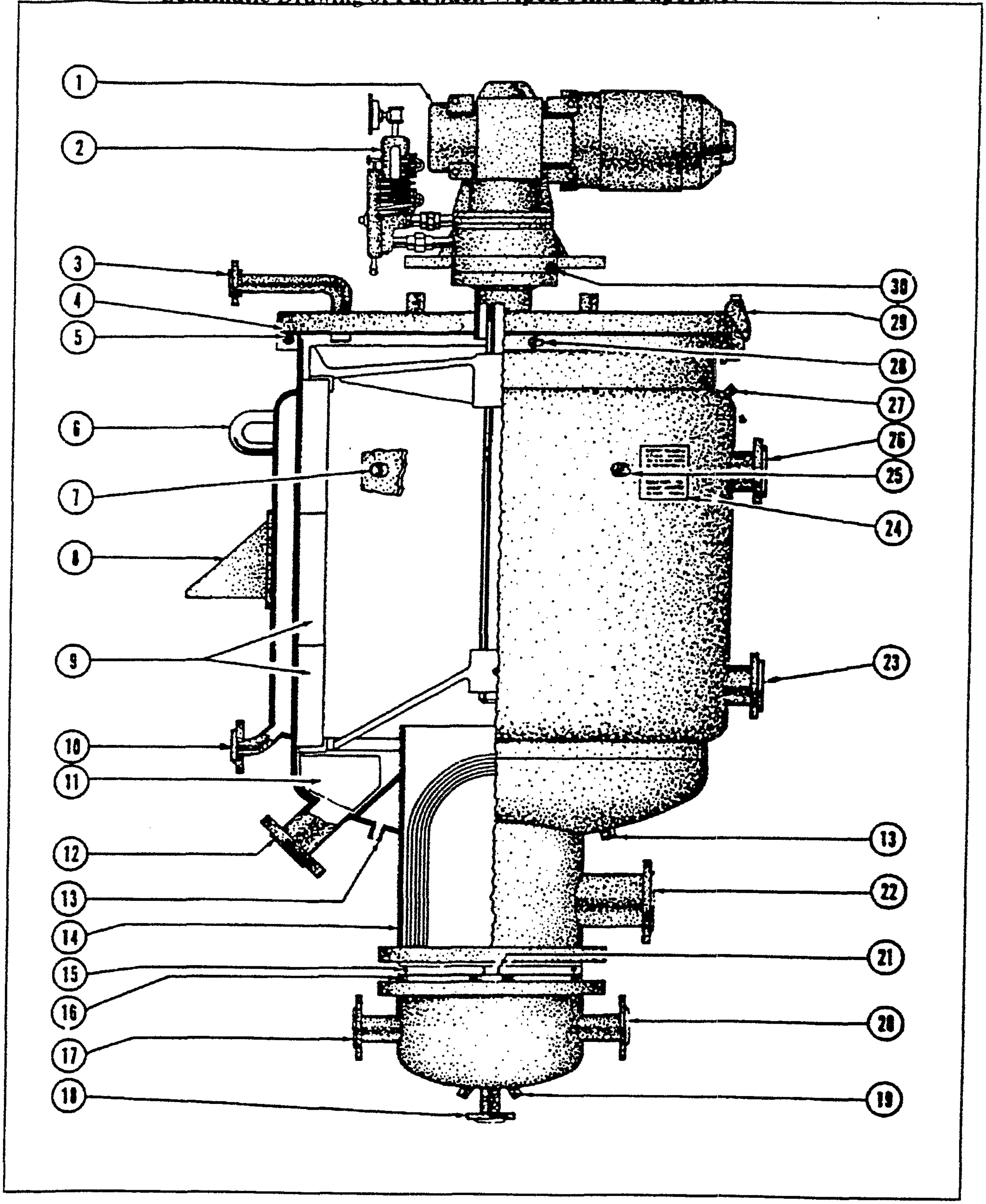


FIGURE VI-14 A
Schematic Drawing of Fat Jack Wiped Film Evaporator



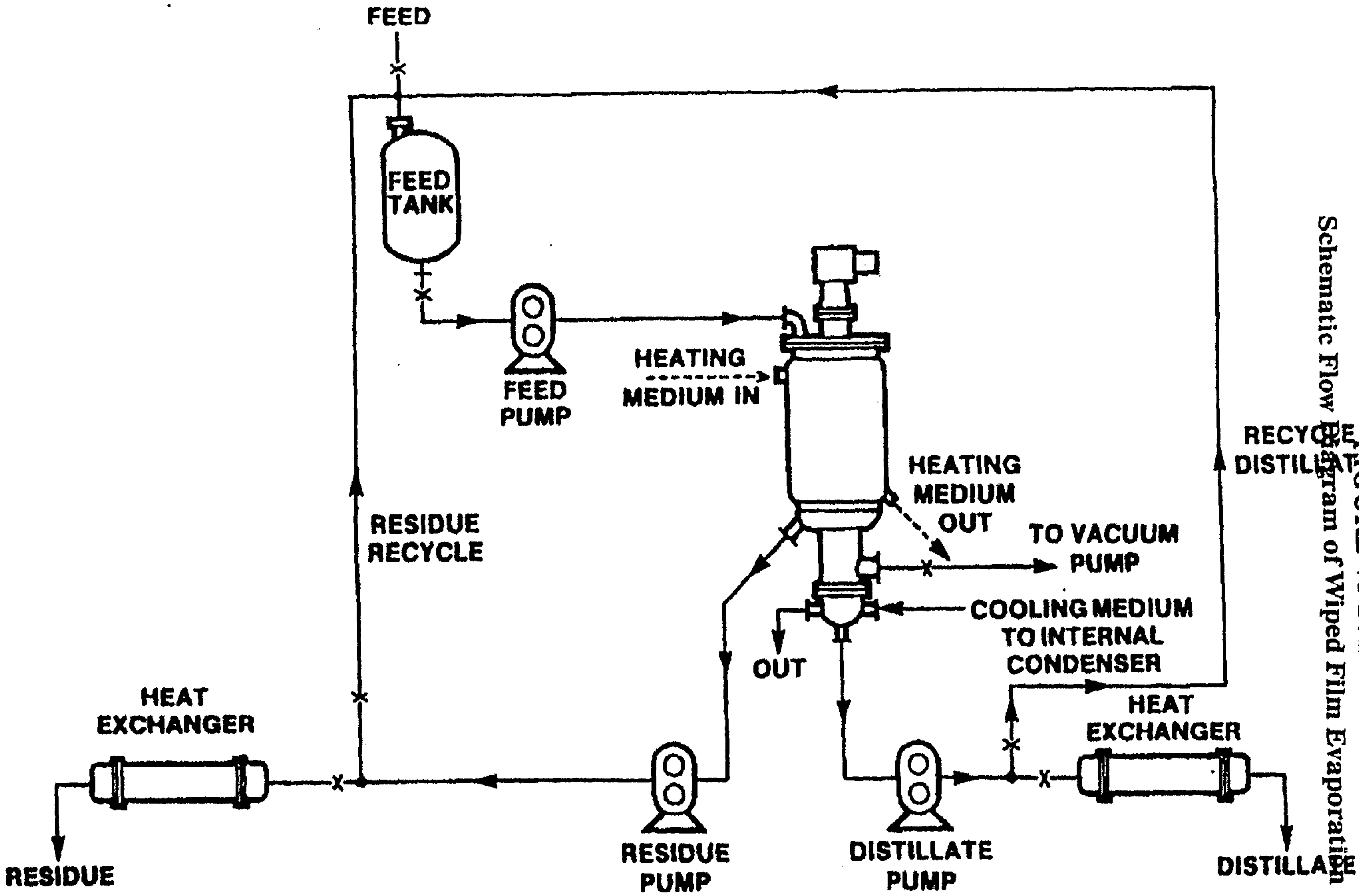


FIGURE VI-14 B
Schematic Flow Diagram of Wiped Film Evaporation